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The UM-Dearborn Catalog is a fundamental source of information concerning academic opportunities, policies, regulations, and procedures. It is each student's responsibility to become familiar with the information contained herein.

The University of Michigan-Dearborn reserves the right to revise any content contained in this publication at its discretion and to make reasonable changes in requirements as approved by official action of the University of Michigan-Dearborn University Curriculum and Degree Committee. Except in the case of error or unless otherwise noted, approved changes made to program and degree requirements become effective the appropriate fall semester and apply to all students admitted to the University for that academic year.
Students who do not attend for one calendar year must be readmitted to the University through their Academic Unit and must satisfy degree and program requirements in effect at the time of their readmission.

Information in this Undergraduate Catalog is as of June 2018. Every care has been taken to assure its accuracy; however, the University cannot be responsible for errors and reserves the right to change programs, requirements and policies at any time after the publication of this Catalog. Current information is available through Unit and Departmental Offices.

Courses A-Z

Accounting (ACC)

ACC 298  Financial Accounting  3 Credit Hours
The first course, of a two-course sequence, to introduce accounting concepts, principles, financial statement preparation, and the uses of accounting information. Topics include fundamental concepts and procedures of financial accounting including income measurement, asset valuation, financial statement preparation and analysis, and uses of accounting information for decision making.
Prerequisite(s): (MATH 104* or MATH 105* or Mathematics Placement with a score of 115 or MATH 113* or MATH 115* or Mathematics Placement with a score of 116)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior or Graduate

ACC 299  Managerial Accounting  3 Credit Hours
To introduce managerial accounting concepts and applications. Specific topics include: cost terminology, cost behavior, product costing systems, budgeting, standard costing systems and variance analysis, and cost allocation methods. To connect the materials in this course to concepts covered in the prerequisite course, ACC 299 begins with financial statement analysis. Discussion of ethics and globalization issues will be interwoven into the presentation of course materials.
Prerequisite(s): ACC 298

ACC 304  Auditing & Forensic Examinations  3 Credit Hours
To study forensic examination and investigation techniques including typical embezzlement and financial statement fraud scenarios, fraud risk factors, sources and uses of evidence, and interrogation and surveillance techniques. Specifically, the course presents an introduction to forensic accounting and fraud examination by studying the nature of fraud, how it is committed, and the motivations of those who defraud an organization, owners, and capital markets. Fraud detection includes the recognition of fraud symptoms and approaches to act on those symptoms. Fraud investigation includes the examination of a fraud act, methods used to conceal the act, and other methods specific to detect various types of fraud. Other course topics may include expanding assurance services, advanced internal control testing, and risk based investigations. Special attention will be given to the changing role and services offered by internal auditors and fraud examiners, and responsibility to the public.
Prerequisite(s): ACC 298
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Business or Engineering and Computer Science or Arts, Sciences, and Letters
ACC 355  Cost Accounting and Analysis  3 Credit Hours
To study the development, analysis and interpretation of accounting information for planning and controlling costs and revenues. Topics include: cost concepts, cost behavior, product costing systems, cost allocation systems, budgeting, standard costs and variance analysis and performance evaluation techniques.  
Prerequisite(s): (ACC 356 or ACC 358) and BE 401

ACC 356  Intermediate Financial Acct 1  3 Credit Hours
To study the accounting function in the business environment; review the operations and operating cycles in service, merchandising, and manufacturing industries; the conceptual accounting base of recording revenue and matching expenses at the traditional point of sale or delivery; the current state of the accounting profession; and an overview of financial accounting statements.  
Prerequisite(s): ACC 299 and ACC 380* and ACC 381*

ACC 357  Intermediate Financial Acct 2  3 Credit Hours
To study financing and investing issues in today’s international business environment, including financing through various ownership and debt instruments, off-balance sheet financing and leverage; investing in tangible and intangible operating assets; investing in financial instruments for return and risk management purposes; and investing in financial instruments to influence or control operations of other business units.  
Prerequisite(s): ACC 356 and ACC 380 and ACC 381 and FIN 401*

ACC 358  Financial Reporting  3 Credit Hours
This course provides an intermediate level analysis of financial accounting focusing on recognition, measurement, and reporting issues associated with assets, liabilities and owner equity in conjunction with related income determination questions. The course is designed for financial statement information users who need a level of sophistication beyond an introductory level, yet not the complete technical expertise of a financial accountant. (YR).  
Prerequisite(s): ACC 298  
Restriction(s): Cannot enroll if Major is Accounting

ACC 360  Federal Income Taxation  3 Credit Hours
To acquaint the student with the federal income tax, tax research, tax planning, and application of tax laws to taxable entities. The course will introduce the student to a broad range of tax concepts within a framework of financial accounting principles. Emphasis will be placed on the taxation of business entities, individual taxpayers, and the differences between financial and tax accounting. The use of technology to research problem assignments will be used to develop students’ business communication and problem solving skills.  
Prerequisite(s): ACC 356 or ACC 358 or FIN 411

ACC 380  Accounting Information Systems  3 Credit Hours
To study the concepts, theory, organization and application of accounting information systems and the flow of accounting data through transaction cycles. Topics include: the principles of accounting systems design, internal control analysis and development and the overall evaluation of networked computer-based accounting systems. Emphasis is placed on transaction processing systems, internal control systems, and computer-assisted decision making for unstructured problems by employing accounting databases.  
Prerequisite(s): ACC 299  
Corequisite(s): ACC 381

ACC 381  Accounting Info Sys Lab  1 Credit Hour
ACC 381 is a lab component of ACC 380. Students will complete weekly laboratory assignments to reinforce the concepts of ACC 380 to use information technology to solve business problems. In addition, the use of several common applications (e.g., Word, Excel, Access, and PowerPoint) will also be covered at the beginning to advanced levels.  
Prerequisite(s): ACC 299  
Corequisite(s): ACC 380

ACC 438  Advanced Federal Income Tax  3 Credit Hours
This course is intended to equip students with both theoretical and practical tools to manage all significant facets of production process costs, revenue streams, budgeting, and the related reporting system. The course focuses on topics such as managing “upstream” cost, cost structures, control tools, establishing standards, reporting processes, analysis to improve per unit profitability, and budgeting. The above topics will be used to develop resource plans to achieve management’s objectives. (YR).  
Prerequisite(s): ACC 355

ACC 416  Advanced Financial Acct 1  3 Credit Hours
To study advanced operating issues of revenue recognition and matching related expenses, including compensation, taxation, and capital costs; and a comprehensive analysis of financial statements, the related disclosures, and their information content.  
Prerequisite(s): ACC 357 or ACC 358

ACC 417  Adv Financial Accounting 2  3 Credit Hours
This course is intended to help students gain expertise in preparing financial statements for complex business organizations. Specific topics include: the preparation of segmental and consolidated financial statements; intricate accounting issues associated with business combinations including but not limited to combinations at the date of acquisition and periods post acquisition; analysis of inter-company transactions such as inventory and asset transfers between parent and subsidiary; reporting for segments of a business as well as interim reporting; foreign exchange issues including inter-period reporting and financial statement translation; international reporting issues associated with all of the above, as well as, other topics. (YR)  
Prerequisite(s): ACC 357

ACC 439  Not-for-Profit Accounting  3 Credit Hours
To study the principles and procedures of accounting for not-for-profit entities. Topics may include: state and local government financial accounting, financial accounting for selected other entities, managerial concepts and current issues. Students will not receive credit for both ACC 439 and ACC 539.  
Prerequisite(s): ACC 356
ACC 457 Auditing  3 Credit Hours
To introduce students to the audit profession, process, and practice. Topics include general auditing and ethical standards, principles of internal control and audit objectives, audit testing and sampling techniques, as well as the auditor’s responsibility for communications and risk assessment.
Prerequisite(s): ACC 357 and BE 401
Restriction(s):
Can enroll if Class is Senior

ACC 480 Information Tech Eval& Control  3 Credit Hours
The course emphasizes the control and evaluation of information systems to ensure accounting and management financial reporting and information processing objectives are accomplished. The course covers the theory of control evaluation, design of internal control, and the evaluation of internal controls in traditional and emerging information technology environments. Emphasis will be placed on current technologies in use by business organizations, emerging technologies, and the application of current profession guidance to evaluate existing and proposed information systems. (YR).
Prerequisite(s): (ACC 380 or MIS 310) and ACC 457*

ACC 482 Seminar: Accounting  1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

ACC 487 Advanced Auditing  3 Credit Hours
To introduce students to advanced audit and assurance service practices, strategies, and techniques. Topics include audit strategy, fraud, internal and operation audits, auditor liability, issues in audit information technologies, and audit practice. (YR)
Prerequisite(s): ACC 457
Restriction(s):
Can enroll if Class is Senior

ACC 492 Research: Accounting  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

African & African-American Studies (AAAS)

AAAS 106 Intro to the African Past  3 Credit Hours
This course is a survey of the social, economic, political, intellectual and cultural heritage of the African peoples from pre-history to the present. The emphasis is on the internal dynamics of the African society through five millennia, as well as the impact of external forces on African life. Themes of particular interest: the roots of African culture, the trans-Atlantic slave trade and the African Diaspora in the New World, the European Conquest and the character of the colonial order and the ongoing struggle to end the legacy of alien domination. (YR)
Restriction(s):
Can enroll if Level is Undergraduate

AAAS 239 Intro to Lit: African American  3 Credit Hours
A study of African-American literature designed to expose students to important periods, works, and authors within historical context. Topics will include slavery, reconstruction, the Great Migration, the Harlem Renaissance, and the contemporary renaissance in Black women’s literature. Students will be required to read critically, discuss, analyze, and write their responses to the several literary genres that will be incorporated (fiction, drama, poetry). (YR).

AAAS 300 Introduction to AAAS  3 Credit Hours
This gateway course in the African and African American Studies Program introduces students to the intellectual debates, historical perspectives and cultural issues central to the field of African and African American Studies. The course readings draw from the disciplinary strengths of the Humanities as well as the Social and Behavioral Sciences. Course materials include selections from literature, film, music, art, drama, folk and popular culture. The course content is supplemented by attendance at off-campus events and visits to institutions featuring significant aspects of African and African American history and culture.
Restriction(s):
Cannot enroll if Class is Freshman

AAAS 304 Detroit History and Culture  3 Credit Hours
This interdisciplinary course explores the political, social, and cultural history of Detroit by examining ways various groups and classes have interacted with and been shaped by structures of power and influence. This course highlights trade and commerce, newcomers, and the influence of organizations and institutions within the contexts of labor, race, ethnic, and religious histories and current affairs, and examines how these fit into the evolution of Detroit from the 19th century to the present. Where pertinent the influence of national and international movements are included. (YR)

AAAS 313 African American Religions  3 Credit Hours
Full Title: African American Religious Experience This lecture course presents a survey of African American expressions across diverse religious traditions including Christianity, Islam, Judaism, Buddhism, and will explore contested forms of spiritual expression such as secularism and new religious movements. The course tracks these experiences from the late 18th to the 21st century in light of the contemporaneous context of social, political, and economic forces in the United States. No prerequisites. (YR)

AAAS 316 African American History  3 Credit Hours
This course will trace the experience of African Americans from their first landing in Virginia in 1619 through slavery and the Civil War. Emphasis will be placed on the origins of racism, the development of the slave system in the United States and the historical developments that led to the Civil War. (YR).
AAAS 320 African-American Music History 3 Credit Hours
A study of African American Music History from its African origins through the present. An understanding of the broad cultural, political, social, economic and media forces that have affected African Americans, their music and history- and in turn, the many important ways that African American music has influenced culture. Course examines multiple genre of music including classical, spiritual, jazz, blues and rap.
**Restriction(s):**
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAAS 321 Untold Caribbean: Field Course 3 Credit Hours
**Full Course Title:** Dark History and Untold Stories: Field Class in Caribbean Historical Archaeology. Field Class: involves international travel and required costs in addition to tuition. This class explores the story behind Caribbean "paradise." We use the analytical methods of historical archaeology to "read" sites of enslavement and resistance, as well as modern museum interpretations of Caribbean heritage, and engage in the production of new archaeological knowledge through excavation. We will ask how negative or "dark" history should be remembered, what life was like on Caribbean plantations, and how histories of slavery are relevant now. Throughout, we will examine how archaeology can tell the untold stories of the many people-black, white, free, and enslaved-who never made it into the history books. We will also contribute new voices with a "mini-field season" of archaeological excavation: students can gain a glimpse into scientific archaeology, and get to try out fieldwork to see if they would gain from a full field school. (S,OC)

AAAS 322 Psychology of Prejudice 3 Credit Hours
A consideration of ethnic (including racial, sexual, and religious) prejudice from the psychological point of view, focusing on the mind of both the oppressor and the oppressed. (AY).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101

AAAS 325 Econ of Poverty/Discrimination 3 Credit Hours
An analysis of the economic aspects of poverty and discrimination. Emphasis on the theoretical economic causes of poverty and the economic bases for discriminating behavior, the impact of poverty and discrimination on individuals and society, and the effect of reform policies on the two problems. (AY).
**Prerequisite(s):** ECON 201 and ECON 202

AAAS 333 Intro to Gospel Music 3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recordings, videos, films, and at least one field experience. Underlying the course is the theory (Mellonie Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).

AAAS 340 Race and Evolution 3 Credit Hours
An evolutionary survey of the biological differences among human populations in response to such factors as climate, culture, disease, nutrition and urbanization. The meaning of racial variation is discussed in terms of adaptation to environmental stress. "Race" is rejected, racism is discussed. (YR).
**Prerequisite(s):** ANTH 101

AAAS 345 West Africa Since 1800 3 Credit Hours
A history of the West African peoples since 1800, which focuses on their unique cultural heritage. Themes include: West Africa before the advent of alien domination, the European Conquest, West Africa under the Colonial regimes, and the liquidation of colonial rule and the reassertion of West African independence. (AY).

AAAS 364 African Exper in the Americas 3 Credit Hours
This course is a survey of African populations and cultures from 1500 to the present throughout the Americas. The focus of the course is on the Caribbean and Latin American contexts of these populations, but comparisons to North America will be made. Topics include the slavery, the relationship between Africans and indigenous populations, religions, politics, music, and questions of race and ethnicity. Readings will include ethnographic description, history, biography and fiction. (YR).
**Prerequisite(s):** ANTH 101
AAAS 385  Black Cinema  3 Credit Hours
The course will examine selected films from African American and African film traditions in order to analyze how their cultural production is responsive to the conditions of social oppression, economic under-development, and neo-colonialism. How film traditions define "Black aesthetics" will also be discussed. (AY).

AAAS 388  W. African Music: Trad.&Glob.  3 Credit Hours
West African popular music contains a unique mixture of African, Cuban, European and American influences. With the advent of radio and recording, music that was once locally based is now part of a national and international popular music industry. This course offers an overview of modern West African music, both traditional and popular. The course begins with an introduction to traditional West African instruments and musical genres. Next, there is an exploration of the fusion of traditional African styles with European, Cuban and American styles during and after the colonial era. The course culminates with an examination of the contributions of West African musicians to the World Music scene, focusing on issues of representation and Fair Trade. 
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or AAAS 106 or AAAS 275 or HUM 100 or HUM 270

AAAS 389  Odyssey of Black Men in Amer  3 Credit Hours
This course will examine the struggle of African American men for personal, political, and creative expression. This course incorporates several literary genres (narrative, fiction, essay, drama, and poetry) and the literary voices of black men who range from professional writers to politicians, from athletes to actors. Students will be required to critically read, discuss, analyze, and write their own responses to the literature found in the texts. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

AAAS 390  Topics in Af & Af Am Studies  3 Credit Hours
This course examines problems and issues in selected areas of African and African American Studies. The specific title of the course will change in the Schedule of Classes according to content. Course may be repeated for credit when specific topic differs. (OC).
Restriction(s): Can enroll if Level is Undergraduate or Professional Development

AAAS 393  Black Women, Rel & Spirituality  3 Credit Hours
This lecture course surveys descriptive and critical literature relevant to the religious and spiritual experience and thought of African diasporic women. Studying religiosity and spirituality among this population helps students understand this influential, culturally-constructed world view of Black women as they engage in a variety of institutions including healthcare, economic activity, the criminal justice system, politics, and social relationships. The course gives particular attention to Black feminist and Womanist literature on these topics. (AY)
Restriction(s): Cannot enroll if Class is Freshman

AAAS 403  Minority Groups  3 Credit Hours
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. Students cannot receive credit for both AAAS 403 and AAAS 503. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s): Can enroll if Level is Undergraduate

AAAS 404  Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic, and political - in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a 'natural order', obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors, and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both AAAS 404 and AAAS 504.
Restriction(s): Can enroll if Class is Freshman or Sophomore or Junior or Senior Can enroll if Level is Undergraduate

AAAS 433  Race/Ethnic Health  3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequality-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy interventions. (OC)

AAAS 4401  Seminar: African Diaspora  3 Credit Hours
Research seminar on the history of the African Diaspora in the Atlantic World. This course covers examples of classic texts in the field, as well as significant new scholarship, with an emphasis on critical reading, analysis, and the development of an independent research project. Students gain a deeper understanding of the significance of the African Diaspora in the New World, derived from lectures and discussions providing an overview of this subject, as well as the micro views gleaned from sharing classroom presentation about students’ individual research topics. The graduate version of this course includes weightier readings and assignments, with a research paper for potential publication.
Prerequisite(s): HIST 300 or AAAS 2755 or HIST 345 or AAAS 345
Restriction(s): Cannot enroll if Class is Freshman or Sophomore or Graduate

AAAS 449  Black Family in Contemp Amer  3 Credit Hours
The African-American family is examined in relationship to the historical and contemporary forces that have shaped its characteristic patterns of family life. These forces include the influence of slavery, urbanization, racial discrimination and urban poverty. The patterns of family life include parental roles, family structure, kinship relations, and gender roles. (YR).
Prerequisite(s): SOC 200 or SOC 201
AAAS 469 Contemporary African Amer Lit 3 Credit Hours
An intensive study of major 20th-century African-American writers. Fiction, poetry, autobiography, and drama will be examined but one genre will be stressed in any given term, e.g., the novel. Lectures will provide historical and biographical context for analysis and discussion of the works. Students cannot receive credit for both AAAS 469 and AAAS 569. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Cannot enroll if Class is Graduate
AAAS 470 Black Women / Lit, Film, Music 3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender and class have shaped the creative work of Black women. Students will be required to read, discuss, analyze and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash, and singer Billie Holliday.
Prerequisite(s): FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 237 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters
AAAS 473 Race, Crime, and Justice 3 Credit Hours
This course is an analysis of race and its relation to crime in the criminal justice system. Students will analyze and interpret the perceived connection between race and crime, while exploring the dynamics of race, crime, and justice in the United States. This course is designed to familiarize students with current research and theories of racial discrimination within America’s criminal justice system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman
AAAS 477 African American English 3 Credit Hours
An examination of the structure, history and use of African-American English. Topics will include the pronunciation, grammar and vocabulary of African-American English, theories of origin, linguistic repertoire and code-switching in African-American communities, the Ebonics controversy, and the role of this variety in education and identity formation. Student cannot receive credit for both AAAS 477 and AAAS 577.
Prerequisite(s): LING 280 or LING 281 or LING 480
Restriction(s):
Can enroll if Level is Undergraduate
AAAS 491 Topics in African Diaspora 3 Credit Hours
This course deals with African Diasporan history from the 19th century to the present. The method is by definition cross-cultural and comparative, requiring that the works or figures under study represent a diversity of Diasporan nationalities and/or cultures. The course may focus on a wide range of topics. Students cannot receive credit for AAAS 491 and AAAS 591 when the topic title is the same.
AAAS 491C Topics in AAAS 3 Credit Hours
Topic: Senior Research Seminar: Africa and the New World Diaspora. A history research seminar exploring the broad history of Africa and its descendants in the New World. Emphasis will be placed on a series of cross-cultural but interconnected themes including: African civilizations, the trans-Atlantic slave trade and comparative systems of servitude, the Haitian Revolution, the American Civil War, the European conquest of Africa, trans-Atlantic systems of inequality, the World Wars, the African intellectual renaissance, the Civil Rights Movement in the United States, and Independence Movements in Africa.
Prerequisite(s): HIST 300
AAAS 498 Thesis 3 Credit Hours
Students pursuing the AAAS minor or an area of focus in African and African American Studies may choose to complete their coursework with a final thesis project that reflects research interests developed during their course of study. This thesis, which can be used to fulfill three (3) hours of the required upper-division course work, will be written under the direction of a faculty member whose scholarly expertise is compatible with the research field(s) of the student. (OC).
Prerequisite(s): AAAS 275 or AAAS 239 or ENGL 239 or HIST 106 or AAAS 106
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
AAAS 499 Independent Study 3 Credit Hours
Students pursuing the AAAS minor as well as those interested in focusing on some particular area in African and African American Studies may wish to do research on a topic not covered in the regular AAAS curriculum. This course provides an opportunity for students to conduct such research under the direction of a qualified faculty member. The project must be defined in advance in writing. (OC).
Prerequisite(s): AAAS 275 or AAAS 239 or ENGL 239 or AAAS 106 or HIST 106
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
American Studies (AMST)

AMST 300  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic, and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americas - as determined by factors such as gender, race, class, ethnicity, and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience.

Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

Restriction(s):
Can enroll if Level is Undergraduate

AMST 390  Topics in American Studies  3 Credit Hours
Examination of problems and issues in selected areas of American Studies. Title in the Schedule of Classes will change according to course content. Course may be repeated for credit when specific topics differ.

AMST 499  Ind. Study in Amer Studies  1 to 3 Credit Hours
The independent study is designed for American Studies majors to provide an opportunity for pursuing a significant scholarly project that explores a topic of interest in American Studies while synthesizing insights gained from prior coursework in American Studies. The course can be repeated for up to 6 credits.

Prerequisite(s): AMST 300 or HIST 3602 or ENGL 306 or SOC 306 or COMM 306

Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is American Studies

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Anthropology (ANTH)

ANTH 101  Introduction to Anthropology  3 Credit Hours
Anthropology emphasizes the holistic study of human beings, in both the past and the present, and this course introduces students to the four primary subfields of the discipline (sociocultural anthropology, biological anthropology, linguistic anthropology, and archaeology). This course shows students how the sub-fields intersect to explain human biological and cultural diversity, provides students with the ability to better understand their own culture in the context of a globalized world, and discusses the applied skills of the discipline. (F, W,S)

ANTH 201  Introduction to Archaeology  3 Credit Hours
Through hands-on labs and comparison of different sites and research projects, this class provides a survey of the theoretical concepts and methods archaeological anthropologist use to learn about people through material things. Considers topics such as site formation, sampling strategies, excavation methods, lab analyses, museum presentations, heritage laws, the history of archaeology, theoretical approaches, and archaeological ethics.

ANTH 202  World Cultures  3 Credit Hours
A comparative study of politics, economics, family and religion in selected cultures—foraging, tribal, peasant, and industrial. Provides a survey of theoretical concepts in social and cultural anthropology through the comparison of ethnographic case studies. ANTH 101 recommended. (YR).

Prerequisite(s): ANTH 101

ANTH 215  Research Skills BSci  1 Credit Hour
This course teaches foundational research and critical-thinking skills necessary for the success of students in the Behavioral Sciences (including Anthropology, Psychology, and Sociology) in conducting university-level research projects, papers, and other research assignments. Students will learn important research skills like distinguishing between scholarly and non-scholarly sources of information, using library search tools to find peer-reviewed and scholarly sources, evaluating and analyzing information sources and using them to build informed opinions and arguments, integrating and synthesizing sources, and using sources ethically. Students will learn these skills through lectures, practice and by applying them through a series of assignments. (F, W, S)

Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

ANTH 260  Michigan Archaeology  3 Credit Hours
Our campus and our state sit on more than 10,000 years of culture and change. Long before there was a place called "Michigan", the land saw the shift from gather-hunters to farmers, and the influence of great cities far away. Three hundred years ago it was a crossroads in the rapidly changing colonial world, where traders, voyagers, and different groups of Native peoples met in friendship and in conflict—but either way the changed each other's worlds. Even today, the material culture of Michigan and its peoples tells us about culture in ways that even a conversation cannot. This class takes Anthropology's explicitly comparative view towards understanding the connections of past and present through both prehistoric and historical archaeology. Hands-on labs, readings, and field trips trace the development of the state from the earliest traces to the present, and focus on people and ideas left out of written history. (YR)

ANTH 270  Anthropology of Food  3 Credit Hours
The goal of this course is to introduce students to basic food theory and food practices across the world. How do ideas and practices of food and eating relate to such topics as taboo, gender, bodies, religion, kinship, and hierarchy? How are the foods people eat meaningful across multiple cultural contexts? In this course, students will develop and practice basic methodologies for food oriented ethnography including interviews and participant observation. They will also engage cultural politics of food by examining how food intersects with nation building, global networks of food production and consumption, alternative food movements, and sustainability. (OC)
ANTH 303 Intro to Women's & Gender Stud 3 Credit Hours
This course provides an interdisciplinary overview of the key theories and topics in Women's and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women's and men's lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.

Restriction(s):
Cannot enroll if Class is Freshman

ANTH 307 Forensic Anthropology 3 Credit Hours
Forensic anthropology has recently seen a lot of exposure through popular television shows like CSI and Bones. Have you ever wondered how much of what you were seeing was real? Do the dead really "talk" about their lives and how they died? This course is designed as an introductory course for students interested in demystifying and getting to know the real forensic anthropology. Forensic anthropology is a specialized sub-field of biological anthropology that applies many of the methods of biological anthropology to the discovery, excavation, and identification of human remains in a medicolegal context. In this class we learn about the human skeleton and explore the key methods that are used in the identification of individuals, such as age-at-death estimation, sex determination, stature, ancestry, and personal identification. We also deal with assessment of different types of trauma, whether or not we can tell the cause and manner of death. The broader ethical roles and responsibilities of forensic anthropologists are also discussed, including discussions of how we determine race/ancestry, as well as ethical responsibilities we have during the investigation of human rights abuses, disasters and criminal inquiries. (F)

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 311 Archaeology of Inequality 3 Credit Hours
Inequality has a history. This class explores these histories through archaeology with a focus on the material culture of the last 500 years. While we have written records from this time, material remains such as buildings, pottery and human bones reveal far more. The mundane details of daily life are where inequality and injustice were (and are?) created, enforced, and resisted, and these mundane details are the material of archaeology. (OC)

Restriction(s):
Cannot enroll if Class is Freshman

ANTH 312 Islamophobia 3 Credit Hours
In our post-9/11 world, Islamophobia, literally fear of Islam, has gained an increasingly visible presence in the United States media, our laws and policies. But what is Islamophobia and where does it come from? How is it experienced by Muslims in everyday life? How is it similar or different from racism or other kinds of anti-Semitism? What can we do about it? And finally, what is the term Islamophobia good for? This course explores Islamophobia from the perspective of sociocultural anthropology. Students will discuss the relationships between Islamophobia and Orientalism, Islamophobia in the media, in literature, and in the everyday experience of Muslims in the United States and Europe. The course ends with an examination of the Arab immigrant experience of Islamophobia in Metro Detroit. (FAY)

ANTH 320 Culture and Global Business 3 Credit Hours
Culture and Global Business lectures, exercises, and case studies explore anthropological concepts and cultural awareness needed by employees, managers, and consultants in multinational and multi-ethnic work environments. Topics include the global economy in anthropological perspective, national culture and business culture, implicit values about work and time, cross-cultural concepts of gender and cross-cultural communication. Special emphasis is given to Asia and developing societies. (AY).

ANTH 321 Untold Caribbean: Field Course 3 Credit Hours
Full Course Title: Dark History and Untold Stories: Field Class in Caribbean Historical Archaeology. Field Class: involves international travel and required costs in addition to tuition. This class explores the story behind Caribbean "paradise". We use the analytical methods of historical archaeology to "read" sites of enslavement and resistance, as well as modern museum interpretations of Caribbean heritage, and engage in the production of new archaeological knowledge through excavation. We will ask how negative or "dark" history should be remembered, what life was like on Caribbean plantations, and how histories of slavery are relevant now. Throughout, we will examine how archaeology can tell the untold stories of the many people-black, white, free, and enslaved-who never made it into the history books. We will also contribute new voices with a "mini-field season" of archaeological excavation: students can gain a glimpse into scientific archaeology, and get to try out fieldwork to see if they would gain from a full field school. (S,OC)

ANTH 325 Anth of Health and Environment 3 Credit Hours
Cultural conflicts over pollution, disease etiology, development and natural resources often originate and are played out in local ecosystems. Anthropologists are increasingly becoming involved as researchers, developers, and activists in these cultural strifes. This course reviews the work of environmental and medical anthropologists as well as other critical scholars who unravel the values, meanings and ideologies associated with ecological issues in given localities. Drawing on theoretical advances in critical medical anthropology, environmental anthropology and applied anthropology the course seeks to improve the knowledge and abilities of student anthropologists in their environmental health work.

ANTH 331 Human Evolution 3 Credit Hours
A survey of biological anthropology. This course is a prerequisite for all other upper-division bioanthropology courses. Topics include the human place in nature, primate biology and behavior, evolution theory, genetics, the fossil evidence for human evolution, human growth, and biocultural adaptation to the environment. (YR).

ANTH 333 Introduction to Primates 3 Credit Hours
Introduction to the fundamentals of primate paleontology, evolution, morphology, and behavior with an emphasis on understanding the evolution of primates and human social behavior. (YR).

ANTH 340 Race and Evolution 3 Credit Hours
An evolutionary survey of the biological differences among human populations in response to such factors as climate, culture, disease, nutrition, and urbanization. The meaning of racial variation is discussed in terms of adaptation to environmental stress. "Race" is rejected; racism is discussed. (AY).

ANTH 341 Human Paleontology 3 Credit Hours
A survey of the evolutionary history of life through the study of fossils and collaborative field and laboratory material. The evolution of humans and the primate order of mammals is emphasized. (AY).

Prerequisite(s): ANTH 101
ANTH 350  Prehistoric Archaeology  3 Credit Hours
Uses archaeological evidence to explore issues of central importance to the present, such as the creation of new technologies, the switch to farming, the rise of social inequality, and the beginnings of cities. Considers archaeological sites in Michigan, as well as Egypt, India, China, Europe, Mesopotamia, Mexico, Peru, and elsewhere from 2 million to 500 years ago. Prerequisite ANTH 101 recommended.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 360  Myth, Magic, and Mind  3 Credit Hours
A broadly based introduction to the range of human mythical and magical traditions. Sophomore standing; ANTH 101 highly recommended. (YR).
Prerequisite(s): ANTH 101 or ANTH 202
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 370  Indians of North America  3 Credit Hours
The origin and development of cultures north of Mexico. A study of various culture areas and representative tribes at contact, and a politico-economic analysis of the fate of American Indians since contact. The perspectives of Native American peoples are taken into account through books, novels, and poetry. Sophomore standing; ANTH 101 highly recommended. (YR).
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 371  African Exp in the Americas  3 Credit Hours
This course is a survey of African populations and cultures from 1500 to the present throughout the Americas. The focus is on Caribbean and Latin American contexts of these populations, but comparisons to North America will be made. Topics include slavery, the relationship between Africans and indigenous populations, religions, politics, music, and questions of race and ethnicity. Readings will include ethnographic description, history, biography and fiction. (YR).
Prerequisite(s): ANTH 101

ANTH 372  Anthropology of Latin America  3 Credit Hours
The course is a survey of Latin American people and cultures from the conquest to the present. It will focus on culture change and sources of conflict by analyzing topics that include the economy, kinship, ethnicity, social stratification, gender, politics, religion, and the arts. Readings will include ethnographic description, history, biography, contemporary fiction. (YR).
Prerequisite(s): ANTH 101

ANTH 373  Anthropology of Middle East  3 Credit Hours
This course explores contemporary life in the Middle East using an anthropological lens. Topics discussed include the geography and diversity of the Middle East; gender, the veil, and Orientalism; Islam, ritual, and everyday family life; and ethics and politics. The course ends with an examination of the Arab immigrant experience in Metro Detroit. Prerequisite: ANTH 101 recommended (YR).

ANTH 374  Anthropology of Europe  3 Credit Hours
Introduces anthropological approaches to European culture, emphasizing ethnographies and community studies as well as social history from the classical and medieval to the present. Will include cultural implications of industrialism and urbanization. May focus on Western or Eastern Europe during a given semester. (AY).
Prerequisite(s): ANTH 101

ANTH 375  Anthropology of Industrialism and Urbanization  3 Credit Hours
May focus on Western or Eastern Europe from ancient to modern, with an examination of the Arab immigrant experience in Metro Detroit. Prerequisite(s): ANTH 101 or WST 275 or WGST 275 or WGST 303 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

ANTH 376  Power & Privilege in SE Mich  3 Credit Hours
An examination of the social and cultural systems that lead to power, privilege, and inequality in American culture. This course takes a local perspective, analyzing systems of inequality as related to such factors as race, ethnicity, gender, social class and sexual orientations. Field trips to local sites are included. (YR)
Restriction(s):
Cannot enroll if Class is Freshman or Graduate

ANTH 381  Who Owns the Past?  3 Credit Hours
The past is not neutral. This class explores this idea, recognizing how representations of and stories about the past play a role in modern discussions and conflicts. Issues such as race, religion, national sovereignty, and both individual and group rights to self-determination, education, and property are all deeply entwined with how we learn about and tell each other about the past. We consider archaeological and historic sites and controversies in Asia, Africa, the Middle East, and the US, and focus on discussion and argumentative writing skills. (OC)

ANTH 390  Topics in Anthropology  3 Credit Hours
Examination of problems and issues in selected areas of anthropology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): ANTH 101

ANTH 391  Topics in Anthropology  3 Credit Hours
Examination of problems and issues in selected areas of anthropology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Junior standing required. (OC).

ANTH 397A  Honors Tutorial  3 Credit Hours
Topic: Sugar, Salt, and Fat. This tutorial takes an historical, anthropological, and biological approach to the use of sugar, salt, and fats in the human diet. People have biological requirements for sugar and salt, and these nutrients have important biological impacts on people. At the same time, the need for these nutrients forces people to migrate great distances; create new technology for production, transport, and consumption of foods containing these nutrients; organize and reorganize their social groups; and develop new economic and political organizations. Specific topics will be the rise of colonialism, slavery, global trade, and the anthropology of eating.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 398  Independent Studies in Anthr  1 to 6 Credit Hours
Readings or analytical assignments in anthropology in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. Permission of instructor required. (F,W).

ANTH 399  Independent Studies in Anthr  1 to 6 Credit Hours
Readings or analytical assignments in anthropology in accordance with the needs and interest of those enrolled and agreed upon by the student and instructor. (OC).
ANTH 409  Human Body, Growth & Health  3 Credit Hours
This course provides an advanced undergraduate introduction to the
topic of human growth and shows how human growth can be a reliable
measure of the psychological, social, economic and moral conditions of
a society. A major theme will be the interplay of biology and culture in
shaping the patterns of human growth and, consequently, the health of
populations and individuals.
Prerequisite(s): ANTH 101
Restriction(s): Can enroll if Class is Junior or Senior

ANTH 410  Archaeological Field School  3 Credit Hours
Full Course Title: Archaeological Field School and Lab Methods- While
participating in a primary archaeological research project, students learn
the methods and techniques of field archaeology and basic laboratory
work, gaining experience in the scientific research process and complex
problem-solving. Depending on the project, some aspects included will
be survey, excavation, mapping, historical background research, and/or
artifact conservation and analysis. Prerequisite ANTH 201 highly
recommended.

ANTH 412  Men and Masculinities  3 Credit Hours
This course addresses the question, "What is a man?", in various
historical, cross-cultural, and contemporary contexts. A major focus on
the social and cultural factors that underlie and shape conceptions of
manhood and masculinity in America as well as in a variety of societies
around the globe. (AY).
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST
275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or
PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s): Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

ANTH 415  Nutrition and Health  3 Credit Hours
The influence of nutrition on physical and mental development from
conception to adulthood. Topics include: 1) the definition and function
of the essential nutrients for people, 2) basic principles of human
growth and development, 3) the causes and consequences of under-
and overnutrition, 4) feeding practices for infants and children and the
development of food habits, 5) nutrient and food problems in the local
region and in global perspective. Students cannot receive credit for both
ANTH 415 and ANTH 515. (YR).
Prerequisite(s): ANTH 101
Restriction(s): Can enroll if Class is Junior or Senior

ANTH 420  Kinship and Marriage  3 Credit Hours
A study of the diversity of kinship and marriage systems, and of
the history of kinship theory which has played a seminal role in the
development of general anthropological theory. Students cannot receive
credit for both ANTH 420 and ANTH 520. (OC).
Prerequisite(s): ANTH 101 or ANTH 201
Restriction(s): Can enroll if Level is Undergraduate

ANTH 421  Education and Culture  3 Credit Hours
How and where do people learn? Why are there schools, and how is
schooling culturally organized? Why do school experiences tend to vary
by "race", social class, and gender? What insights does anthropology
bring to practical problems of learning and teaching? Students cannot
receive credit for both ANTH 421 and ANTH 521. ANTH 101 or SOC 200
recommended. (AY).
Prerequisite(s): ANTH 101
Restriction(s): Can enroll if Level is Undergraduate

ANTH 422  Narrative Anthropology  3 Credit Hours
A consideration of alternative approaches to gaining ethnographic
understandings by reading anthropoligical novels (Bohannan, LeGuin),
fiction and poetry by non-western authors (Silko, Achebe), and travel
writing (Chatwin, O’Hanlon). Junior standing; ANTH 101 highly
recommended. (YR).
Prerequisite(s): ANTH 101
Restriction(s): Can enroll if Class is Junior or Senior

ANTH 425  Language and Society  3 Credit Hours
An examination of the social functions of speech through readings
and exercises, emphasizing schools and other applied settings. Topics
include ethnic and social class dialects, codeswitching, and the
organization of conversation. Students cannot receive credit for both
ANTH 425 and ANTH 525. (OC).
Prerequisite(s): ANTH 101 or LING 280
Restriction(s): Can enroll if Level is Undergraduate

ANTH 430  Medical Anthropology  3 Credit Hours
A comprehensive examination of how culture mediates processes of
illness and healing. Comparative materials are examined which provide
a context for an anthropological analysis of modern biomedicine.
Sophomore standing; ANTH 101 highly recommended. (YR).
Restriction(s): Can enroll if Class is Sophomore or Junior or Senior

ANTH 435  Human Genetics  3 Credit Hours
An analysis of human genetic variation in terms of the theory of
population genetics considers such polymorphisms as blood groups and
variant hemoglobins as well as morphological characters like stature,
skin color, and so on. Emphasis is on the genetics of human populations
and particular attention is drawn to cultural factors affecting human
biology. (OC).
Prerequisite(s): ANTH 101 and ANTH 331

ANTH 440  Religion and Culture  3 Credit Hours
An introduction to the comparative study of religious systems. Explores
religious beliefs and practices in non-Western cultures; surveys
theoretical approaches to the study of religion; and discusses how
religions grow, develop, and change. ANTH 101 recommended. (YR).
Prerequisite(s): ANTH 101

ANTH 444  Political Anthropology  3 Credit Hours
A consideration of some of the major anthropological views of politics,
focusing on the relations of power to kinship, stratification, and religion
in both states and stateless societies. Sophomore standing; ANTH 101
highly recommended. (OC).
Prerequisite(s): ANTH 101
Restriction(s): Can enroll if Class is Sophomore or Junior or Senior
ANTH 450  Anthropological Theory  3 Credit Hours
An historical account of the development of anthropological theory, emphasizing the continuity between consecutive styles of explanation. Substantial consideration of recent theoretical developments in structuralism and ecological analysis. Sophomore standing; ANTH 101 highly recommended. (OC).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 451  Family, Sexuality, Rights  3 Credit Hours
Full Course Title: Family, Sexuality, and Human Rights in a Changing World. This course investigates the changing possibilities for forming families and expressing sexuality, with a focus on how nation states and legal and cultural systems construct and respond to these changes. Selected topics include the meanings of sex, love, marriage, and relatedness in different historical moments; struggles for recognition of varied kinship and family arrangements, such as interracial, interfaith, same-sex, polygamous and multi-partner relationships; and new technologies and their implications for family life. (YR)
Prerequisite(s): (WGST 303 or SOC 303 or ANTH 303 or PSYC 303 or HUM 303) or (SOC 200 or SOC 201) or (ANTH 101 or ANTH 202)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 455  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including: (1) formation and perseverance of immigrant communities and interethnic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles. Students cannot receive credit for both ANTH 455 and ANTH 555. ANTH 101 recommended. (OC).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Junior or Senior

ANTH 459  Human Osteology  3 Credit Hours
An introduction to the methods and theory of human osteology, bone history, pathology, biomechanics and taphonomy. Osteology lecture topics include age, sex, stature and ancestry estimation, the problems of commingling and differential disease diagnosis. The lab component provides hands-on skills. The course investigates how the forensic anthropologist can apply skills to human rights and police investigations and the nuances distinguishing theoretical approaches of forensic anthropology and bioarchaeology.
Prerequisite(s): ANTH 331 or BIOL 130
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

ANTH 460  Economic Anthropology  3 Credit Hours
A comparative examination of the basis of political economy. Economic problems (the production and distribution of goods and services) will be considered in ecological, evolutionary, and political terms. The primary emphasis will be on traditional economies, on production and exchange at the household level, and on the effect of modern market systems on indigenous cultures. (OC).
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 470  Doing Anthropology  3 Credit Hours
A practicum of anthropological theory and method, including ethnographic interview and participant observation. Students will conduct field research and evaluate results with the help of classmates. Students cannot receive credit for both ANTH 470 and ANTH 570. ANTH 101 or SOC 200 highly recommended. (YR).
Prerequisite(s):
Can enroll if Level is Undergraduate

ANTH 477  Ethnographic Film  3 Credit Hours
This course will analyze ethnographic films as a medium for the construction of meaning in and across cultures. It will teach students to understand how the putatively "real" content of documentary film creates a mixture of fantasy, news and "science." Covering texts as varied as National Geographic photographic layouts, traditional ethnographic films made by anthropologists, and auto-ethnographies of cultural groups such as Native Americans and the Trobriand Islanders of Papua, New Guinea, the course will aim to deconstruct such oppositions as indigene vs. alien, us vs. them, and self vs. other. Students cannot receive credit for both ANTH 477 and ANTH 577. (AY).
Prerequisite(s): FILM 248 or HUM 248 or ANTH 101 or ENGL 248 or JASS 248

ANTH 481  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create. (AY).
Prerequisite(s): ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

ANTH 482  Psychological Anthropology  3 Credit Hours
Cross-cultural comparison of theories of human nature, including psychoanalytic anthropology, culture-and-personality, and other theories from Western science, as well as non-Western theories about such concepts as the person, emotions and mental illness. Students cannot receive credit for both ANTH 482 and ANTH 582. ANTH 101 and PSYC 170 or 171 highly recommended. (YR).
Prerequisite(s): ANTH 470

ANTH 495  Anthropology Capstone  3 Credit Hours
Full Title: Anthropology Capstone: Contemporary Issues in Anthropology
This course is designed as a capstone for anthropology majors, and it will provide a well-rounded conclusion to undergraduate studies in anthropology. This course has three primary goals in mind: 1) to explore and critically evaluate contemporary anthropological method and theory around a central theme; 2) to provide students with opportunities to gain real research skills; and 3) to help students prepare for the job market inside and outside of academia. (W,YR)
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Junior or Senior
**ANTH 498  Independent Study  1 to 6 Credit Hours**
Readings or analytical assignments in anthropology in accordance with the interests and needs of students enrolled and agreed upon by the instructor and student. Written permission of instructor required.

**ANTH 499  Readings in Anthropology  1 to 3 Credit Hours**
For students desiring study not available in the regular course offerings. Students cannot receive credit for both ANTH 499 and ANTH 599. (F,W)

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:

- (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Applied Music (MAPP)**

**MAPP 120  Private Instruct in App Music  1 Credit Hour**
For students who desire credit for private lessons on a musical instrument of voice. The lessons are taken outside the University from an instructor approved by the music faculty of the University. Interested students should contact the music faculty at the beginning of the term to arrange for a teacher. 8 hours of instruction over 16 weeks are required for 1 hour of credit. This course may be repeated for up to 8 hours of credit. The student pays the instructor's fee and also tuition for university credit. (F,W)

**MAPP 125  Class Piano I  2 Credit Hours**
Development of skills at the keyboard in harmonization, improvisation, sight reading, accompanying, repertoire, and technique. Emphasis on group learning for beginners. (OC).

**MAPP 126  Class Piano II  2 Credit Hours**
Enhancement of skills at the keyboard in harmonization, improvisation, sight reading, accompanying, repertoire, and technique. Emphasis on group learning for beginners. (OC).

**MAPP 135  Class Guitar I  2 Credit Hours**
Development of skills in reading chord tablature, playing basic accompaniments to folk songs using various strumming and fingerpicking techniques, basic theory, reading, playing rhythms and notes. Emphasis on group learning for beginners. (OC).

**MAPP 136  Class Guitar II  2 Credit Hours**
Enhancement of skills in reading chord tablature, playing basic accompaniments to folk songs using various strumming and fingerpicking techniques, basic theory, reading, playing rhythms and notes. Emphasis on group learning for beginners. (OC).

**MAPP 138  Symphonic Band  1 Credit Hour**
Credit may be earned by students who are regular members of approved symphonic bands.

**MAPP 145  Choir  1 Credit Hour**
One hour of credit per semester may be earned by students who are members of the UM-Dearborn choral ensemble. There will be a concert performance every semester which will be open to the general public. (F,W).

**MAPP 299  Independent St in Appl Music  1 to 2 Credit Hours**
This course assumes a sound knowledge of basic technique and music theory, as covered in MAPP 126 or MAPP 136. Material covered in the course is selected in accordance with the needs and interests of those enrolled and agreed upon by the instructor and the student.

**Prerequisite(s):** MAPP 126 or MAPP 136

**MAPP 320  Adv Private Instr in App Music  1 to 2 Credit Hours**
For advanced students in applied music. The lessons are taken outside the University from an instructor approved by the music faculty of the University. Interested students should contact the music faculty at the beginning of the term to arrange for a teacher. 8 hours of instruction over 16 weeks are required for 1 hour of credit. This course may be repeated for up to 8 hours of credit. Each student is required to pass a jury exam or perform publicly during each semester. The student pays the instructor's fee and also pays tuition for university credit.

**MAPP 399  Independent St in Appl Music  1 to 2 Credit Hours**
This course is intended for those students who have taken MAPP 299, or students at an advanced level who have previously studied piano or guitar formally for several years. Material covered in the course is selected in accordance with the needs and interests of those enrolled and agreed upon by the instructor and the student.

**Prerequisite(s):** MAPP 299

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:

- (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Arab American Studies (AAST)**

**AAST 238  Intro to Lit: Arab American  3 Credit Hours**
This course in an introduction to Arab American literature, its historical and cultural contexts and contemporary relevance. Topics will include the literary and cultural productions of Arab immigrants, their transnational vision, and explorations of such concepts as home, memory and identity; the literary, dramatic and poetic responses of Arab American writers to 9/11 and the ongoing war on terror; the role Arab American literature in offering different versions of Arab and Arab American lives and experiences from the one circulated in mainstream media, Hollywood cinema and culture.

**Prerequisite(s):** COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

**AAST 267  Arab & Arab American Workshop  3 Credit Hours**
The Arab and Arab American Writers Workshop is a creative writing workshop focusing on poetry and fiction. Students will explore Arab American literature, writers, and themes. Students are expected to work on their own manuscripts as well as critique outside readings. The workshop will be conducted under the guidance of Arab and Arab American faculty and is open to all students.

**Prerequisite(s):** COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
AAST 3150 Intro to Arab American Studies 3 Credit Hours
This course explores the local, national, and global conditions through which Arab American identity and its alternatives take shape. It introduces students to humanities and social science approaches to the field of Arab American Studies.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAST 3151 Public Cultural Work 3 Credit Hours
Full Title: Public Cultural Work in Arab Detroit. This course explores the field of public humanities work while providing a topical focus on metro-Detroit based Arab American history and culture. Roughly half of the course will be used to explore different approaches to public humanities work undertaken by scholars. The second half of the course will provide the historical and social context for understanding a particular research question to be examined jointly by the instructor, students, and a local cultural institution. Students will engage in intensive research and work with a cultural institution to represent their findings to the public. Students cannot receive credit for both AAST 3151 and HIST 3672. (W)

AAST 3634 History of Islam in the US 3 Credit Hours
This course traces the long history of Islam and of Muslims in the United States (1730s-present), paying careful attention to the interaction among Muslims across the dividing lines of race, gender, immigrant generations, sect, political orientation, and class, and between Muslims and other Americans.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAST 3673 Arabs & Muslims in Media 3 Credit Hours
Full Title: Arabs and Muslims in the Media This course examines how perception of Arabs and Muslims took shape in the U.S. from the late nineteenth century through the present. Using historical developments as a conduit, we explore the treatment of Arabs and Muslims in news outlets, print media, film, and T.V. productions. For example, we analyze the motivation, plot construction, casting, and content of big budget Hollywood movies for patterns of stereotypes and representations/misrepresentations. (FAY)

AAST 3676 Arab Americans Since 1890 3 Credit Hours
This is a survey of immigration from the Arab Middle East from 1890 to the present. Readings from available scholarship, discussions, and reports facilitate exploring the Arabic-speaking immigrants’ early and recent experiences as art of U.S. society, including settlement, work, worship, military service, leisure, intellectual life, and primary and formal affiliations across the U.S.

AAST 373 Anthropology of Middle East 3 Credit Hours
This course explores contemporary life in the Middle East using an anthropological lens. Topics discussed include the geography and diversity of the Middle East; gender, the veil, and Orientalism; Islam, ritual, and everyday family life; and ethics and politics. The course ends with an examination of the Arab immigrant experience in Metro Detroit. No Prerequisites, but ANTH 101 is recommended. (AY)

AAST 381 Intro to Postcolonial Studies 3 Credit Hours
This course offers a general introduction to Postcolonial Studies - a field of cultural inquiry that questions how personal identity (specifically race, language, and ethnicity) shapes, and is shaped by, the politics of colonization and nationalism. Students will clarify the subject of Postcolonial Studies by examining a variety of cultural and linguistic objects (literature, film, TV-journalism, slave- and middle-passage-narrative, and political manifestos) from a variety of cultural perspectives (Arab American, Anglo-Indian, West African, and Caribbean).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250

AAST 390 Topics in Arab American Study 3 Credit Hours
Examination of various topics dealing with Arab American Studies. Titles will change according to content and schedule of classes. Course may be repeated for credit when specific topic differs. (OC)

AAST 4677 Arab American Identity 3 Credit Hours
Extensive discussions and critical analysis of the main markers of Arab American identity formation from late nineteenth century to present. This seminar provides in-depth assessments of immigrant narratives from various sources and disciplinary approaches on specific racial, ethnic, and gender experiences within the larger U.S. context. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Level is Undergraduate

AAST 4678 Middle Eastern Diasporas 3 Credit Hours
This course explores the diasporas of Arabs, Turks, Assyrians, and Iranians living in Europe and the Americas that have occurred since the 1880s. It pays careful attention to how "aspects of diaspora" shape, mimic, transect, and undermine the political and economic regimes of which they are part. The reception of Middle Eastern communities in different national contexts and historical periods receive special attention as do their adaptive strategies as religious, ethnic, gendered, and racialized minorities. Those enrolled in the graduate level of the course pursue additional readings and assignments.
Prerequisite(s): AAST 3150 or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

AAST 473 Arab American Women Writers 3 Credit Hours
This course examines the literary and cultural contributions of Arab and Arab American women novelists, poets, filmmakers and artists to the development and consolidation of cultures of understanding and coexistence; explores the relations between, among others, citizenship and belonging, race and national security, gender and geographical mobility, and ethnic minorities and mainstream consciousness; stresses how literary and artistic productions of Arab and Arab American women writers and artists fosters alternative visions of socio-cultural coexistence, dialogue, and hospitality by means of technical and stylistic experimental and renovation. For graduate credit take AAST 573. Students cannot receive credit for both AAST 473 and AAST 573.
Restriction(s):
Cannot enroll if Class is Freshman

AAST 490 Topics in Arab Amer Studies 3 Credit Hours
The content of this course will vary. All courses which will run under this number will cover Arab American issues.
Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

Arabic (ARBC)

**ARBC 101 Beginning Arabic I 4 Credit Hours**
First course in the two-course elementary Arabic sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and function in Arabic culture. (F; W, YR).

**ARBC 102 Beginning Arabic II 4 Credit Hours**
Second course in the two-course elementary sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, and writing. (F; W, YR).

**Prerequisite(s): ARBC 101 or MCL 101 or Arabic Language Placement with a score of 102 or Arabic Language Placement with a score of 201 or Arabic Language Placement with a score of 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302**

**ARBC 201 Intermediate Arabic I 4 Credit Hours**
An intermediate-level course designed to increase proficiency in listening, speaking, reading, and writing in a cultural context. Emphasis is placed on acquiring new vocabulary and expanding the use of grammar structures. (YR).

**Prerequisite(s): ARBC 102 or MCL 102 or Arabic Language Placement with a score of 201 or Arabic Language Placement with a score of 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302**

**ARBC 202 Intermediate Arabic II 4 Credit Hours**
Second course in the two-course intermediate Arabic sequence. Continued emphasis on the development of the four skills of listening, speaking, reading, and writing.

**Prerequisite(s): ARBC 201 or MCL 201 or Arabic Language Placement with a score of 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302**

**ARBC 301 Higher Intermediate Arabic I 3 Credit Hours**
This course is designed for students who have already had the equivalent of four semesters of Arabic instruction. The course emphasizes the four language skills with specific attention to the productive skills, oral and written. The course introduces authentic reading materials drawn from different disciplines such as religion, literature, history, and politics, reflecting different styles of Arabic and different periods. (F)

**Prerequisite(s): ARBC 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302**

**ARBC 302 Higher Intermediate Arabic II 3 Credit Hours**
A continuation of ARBC 301. It continues to develop the four language skills with specific attention to the productive skills, oral and written. The course introduces authentic reading materials drawn from different disciplines such as religion, literature, science, politics, reflecting different styles of Arabic and different periods. (W, YR)

**Prerequisite(s): ARBC 301 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302**

**ARBC 303 Advanced Arabic 3 Credit Hours**
This course is an introduction to narrative traditions in Arabic through the close readings of a variety of essays. It is designed to give students experience in reading specialized short texts including modern Arabic literature and the social sciences. Each session will be organized around a particular author, genre, theme, or period, including the novel, political essay, the short story, historical prose, drama, and film, with special emphasis on the Arabic literature of Egypt and the Levant.

**Prerequisite(s): ARBC 302**

**Restriction(s):**
Can enroll if Class is Freshman or Sophomore or Junior or Senior

**ARBC 305 Language of Business 3 Credit Hours**
An introduction to the language and cultural practices of the Arab world of business. Particular emphasis will be placed on learning the terminology used in typical business correspondence and documents related to the world of finance, investment, import, and export, and commerce. A variety of businesses will be examined and opportunities for practice in reading and composing business letters will be provided. (W, YR)

**Prerequisite(s): ARBC 301**

**ARBC 331 Survey of Arabic Literature 3 Credit Hours**
This course gives students an appreciation of Arabic civilization through the study of excerpts from the masterworks of the literary and intellectual Arabic heritage. It provides practice in reading pre-modern and modern Arabic literary forms.

**Prerequisite(s): ARBC 301**

**ARBC 332 Arabic Cinema 3 Credit Hours**
The course examines the development of Arabic cinema in its socio-cultural contexts through a range of selected films. It covers the different cinematic genres, prevalent themes and diverse trends and schools across the spectrum of Arab countries including Egypt, Tunisia, Lebanon, Morocco, and Palestine. The course elaborates on the careers of film directors and their approaches to film making and to the cultural issues of their time. The course will be conducted in Arabic.

**Prerequisite(s): ARBC 301**

**ARBC 333 Arabic Civilization 3 Credit Hours**
This course gives students an appreciation of Arabic civilization through the study of excerpts from the masterworks of the literary and intellectual Arabic heritage. It provides practice in reading pre-modern and modern classical Arabic texts drawn from a variety of intellectual disciplines. Students may not receive credit for both MCL 3350 and ARBC 335.

**Prerequisite(s): ARBC 302**

**Restriction(s):**
Can enroll if Class is Sophomore or Junior or Senior

**ARBC 335 Arabic Literature and Culture 3 Credit Hours**
An introduction to the literature and other art forms of the modern Arab world in cultural and historical context. Topics include the Arab worldview, religious attitudes and self-expression, and ethnicity and gender. The course assumes no prior knowledge of the region. All readings will be English translation. (YR).
ART 201 Beginning Painting 3 Credit Hours
Lectures on the fundamentals of painting along with work in the studio. Basic ideas of structure, composition, and color are explored through individual and group instruction. Students work from still-life and from the model. This is a broad introductory painting course designed for the student unfamiliar with fundamentals of design and color. Material: acrylics. (YR).

ART 202 Beginning Drawing 3 Credit Hours
Lectures alternate with studio work in the investigation of drawing fundamentals. Students receive individual and group instruction as they work from still life setups, nature, and from the model. Emphasis is placed on the development of critical skills and perceptual drawing techniques for students with little or no studio experience. Pastel, charcoal, conte, pencil, and inks will be used. (YR).

ART 204 Beginning Watercolor 3 Credit Hours
Through lectures and studio work, students will explore the fundamentals of watercolor painting. To demonstrate the dynamics of the medium, a variety of approaches and techniques will be used, including realistic, abstract, and experimental painting. Subject matter includes still life, the figure, possible outdoor sketching and painting from the imagination. All levels of students are given individual guidance. (YR).

ART 206 Basic Design-Color 3 Credit Hours
Students will be introduced to the complex and diverse subject of color. The areas of study include principles and theories of color, practical application and technique, and the phenomenon of color interaction. The art elements (line, shape, value, space, form, and texture) and design principles will be applied within specific assignments. Compositional concerns and creative problem solving will be emphasized. (YR).

ART 210 Beginning Digital Design 3 Credit Hours
This course introduces students to the fundamentals of digital design, and how it fits into our evolving media landscape. It teaches skills in areas of digital illustration, image making, augmented reality, and web design. Methods of both creating and editing creative digital projects will be covered, including color theory, design concepts, layers, tools, optimization of content for web and multimedia content. In addition, students will be able to identify the impact and development of digital technology on everyday life through readings and discussions related to new media history, visual literacy, and critical theory, while allowing students to apply their own specific interests to each project.

ART 220 Intro to Digital Photography 3 Credit Hours
This course focuses on the creative use of digital imaging software and hardware. Students are exposed to contemporary artists and professionals working in traditional and digital photography. Students also consider critical issues surrounding the aesthetic, ethical and theoretical aspects of digital imaging technology and current photographic practice. Application of these approaches, processes and concepts are discussed in terms of their relevance within and beyond art practices, including art as personal expression and as a professional field. Each assignment engages students’ critical thinking as they explore the artistic possibilities of digital photography while expanding their technological and aesthetic knowledge. During project critiques, students practice articulating their thought processes in relation to their own work and the work of their peers.

ART 230 Intermediate Digital Photo 3 Credit Hours
The design emphasis will be on line and movement, positive/negative space, push/pull dynamics and a study of the nature of grids. The color emphasis will focus on tertiary colors, the effect of variations in color intensity and tonal contrast. There will also be a study of various twentieth century design movements such as the Russian Avant Garde, Constructivism and the Bauhaus, with some assignments modeled on these styles.

Prerequisite(s): ART 206
Restriction(s): Can enroll if Level is Undergraduate.
ART 321 Intermediate Painting 3 Credit Hours
Various painting approaches, styles and concepts are explored beyond the basic level through lectures and studio work. Students are encouraged to develop their own personal style as they master new techniques and types of subject matter. This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.
Prerequisite(s): ART 202

ART 322 Intermediate Drawing 3 Credit Hours
The fundamentals of drawing are refined beyond the basic level in a variety of media through lectures and studio work. Students are encouraged to develop their own personal style as they master new techniques and types of subject matter. This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.
Prerequisite(s): ART 202

ART 323 Figure Drawing 3 Credit Hours
This course is designed to teach each student about the complex human form through the act of observation, drawing, and memorization of specific anatomical terms. Emphasis will be on proportion, anatomy, composition, and expression. Students will draw from a live model.
Prerequisite(s): ART 202

ART 324 Intermediate Watercolor 3 Credit Hours
Various watercolor painting approaches, styles and concepts are explored beyond the basic level through lectures and studio work. Students are encouraged to develop their own personal style as they master new techniques and types of subject matter. (still life, the figure, landscape and painting from the imagination). This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.
Prerequisite(s): ART 204

ART 322 Creating the Graphic Novel 3 Credit Hours
This course focuses on the creation of an original graphic novel from inception to fully developed story. Students work on character, plot development, dialogue, drawing style, and layout planning, and are encouraged to introduce any cross-disciplinary techniques such as digital applications when appropriate. Lectures and readings consider contemporary media. This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.
Prerequisite(s): ART 202 or ART 206
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

ART 360 Introduction to Printmaking 3 Credit Hours
This studio course is an introduction to the fundamentals of printmaking. The basic techniques of intaglio, lino-cut, chine chole, lithography and monotype printing methods are utilized in projects. As a deeply interdisciplinary practice, printmaking engages with other artistic media of drawing, painting, and collage. Each student is encouraged to incorporate other materials based on her/his major, interests or expertise.
Prerequisite(s): ART 201 or ART 202 or ART 204 or ART 206

ART 390 Topics in Applied Art 3 Credit Hours
Study of various media and techniques in selected areas of applied art. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when the topics differ.
Restriction(s):
Can enroll if Level is Undergraduate

ART 399 Independent Studies in App Art 1 to 3 Credit Hours
Readings or analytical assignments in applied art in accordance with the needs and interests of those enrolled and agreed upon by the student and the instructor. (FW).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Art History (ARTH)

ARTH 101 Understand Art-Ancient to 1400 3 Credit Hours
Full Course Title: Understanding Western Art from Ancient to Medieval - This course asks the question-what does art tell us about the cultures that make it? The course investigates how culture, religion, and social structures manifest themselves in artworks created in the ancient world, for instance in Egypt or Greece, through the dawn of the Renaissance. Students are introduced to the key terms, concepts, and analytical skills that allow us to think critically about the importance of art during this period of time.

ARTH 102 Understanding Art 1400 to Now 3 Credit Hours
Full Course Title: Understanding Western Art from the Renaissance to Now- This course traces the development of European and American art from the revival of classical humanism in the Italian Renaissance toward the rise of consumer culture during the twentieth century. Students explore key works of Western art from Michelangelo to Andy Warhol. Students are introduced to the key terms, concepts, and analytical skills that allow us to think critically about the cultural importance of art from 1400 to the present.

ARTH 103 Arts of Asia 3 Credit Hours
An introduction to the visual arts of three Asian civilizations: India, China, and Japan. Since this is a survey, the focus will be placed on major monuments that are characteristic of these artistic traditions. In order to better understand the works of art, the cultural milieu including religion, philosophy, and parallel arts will be considered. (YR).

ARTH 104 Arts of the Middle East 3 Credit Hours
From the eighth century, a new religious community with no developed artistic heritage spread rapidly over the ancient empires of the near and middle east and as far west as Spain and Hungary. Appropriating established forms and traditions, Muslim cultures created a brilliant system of religious and secular art that reveals national diversity and an underlying unity of purpose. This course provides an introduction to the visual traditions of Muslim cultures. (YR).

ARTH 105 Creation of Art 2 Credit Hours
An art appreciation course based on videotapes. Great art does not completely yield its secrets. The course helps the student to understand the subject, the message or content of the creation and the method that the artist used in making it. This course does not fulfill the Art History concentration requirement. (FW).
ARTh 106 Architecture & Society  3 Credit Hours
Full Course Title: Architecture & Society in Western Civilization- This course examines how architecture and the built environment both reflect and shape the societies that constructed them. Through a survey of major works of architecture from Antiquity to the present, students will learn about the technical, functional, and aesthetic considerations that determine why buildings look the way they do. Special attention is given to the uses of architecture, engineering innovations, and design choices.

ARTh 221 Ancient Monuments then and Now  3 Credit Hours
This course examines the "biographies" of three iconic ancient architectural monuments: the Great Pyramids of Egypt, the Parthenon in Athens, and the Colosseum in Rome. We will explore the design, engineering, and original functions of these buildings. We will also investigate how people's perceptions of and interactions with these monuments changed over time, up to and including modern tourism. (F;YR)

ARTh 241 Encountering the Renaissance  3 Credit Hours
Full Course Title: Encountering the Renaissance: Art, Global Exploration, and Social Reform. This class examines the Renaissance through the study of globalization, science and technology, religious reform, and their impact on the visual arts. Students will learn about such topics as the exploration of Africa, Asia, and the Americas, the invention of the printing press, and the revival Classical Art and humanistic learning. (YR)

ARTh 261 Art and Film  3 Credit Hours
Throughout the twentieth-century, painters and sculptors have turned towards the medium of film to make art. This course examines the close relationship between film and visual art when art influences cinema and cinema influences art. Students analyze a movie by a selected filmmaker every week. In addition, concise texts by filmmakers, film historians, and art historians provide context for the development of experimental montage techniques, the relevance of visual art strategies to the art of film, and the discussion of intellectual and societal issues. (OC)

ARTh 304 Studies in Detroit Culture  3 Credit Hours
This course is an attempt to define a modern cultural history of Detroit. Taught by two faculty members, the emphasis of the course will vary but the following aspects of the city's cultural history will be covered is some detail: its literature, arts, music and architecture; its social conditions and broader American cultural context.

ARTh 305 The Arts & Culture of Detroit  3 Credit Hours
This interdisciplinary course explores the modern and contemporary cultural history of Detroit, examining the ways in which various population groups have been creative from the nineteenth century to the present. The course highlights the work of architects, designers, photographers, visual artists, poets, and musicians, and situates them in the broader cultural context of American art and history.

ARTh 311 Art of China  3 Credit Hours
An introduction to representative works of art produced in China from the Neolithic era down to modern times. Examination of the artifact's cultural context will be emphasized, including the study of philosophy (Confucianism and Daoism) and religion (Buddhism).

ARTh 312 Art of Japan  3 Credit Hours
An introduction to representative works of art produced in Japan from the Neolithic era down to modern times. The artifact's cultural context will be examined including religious practice (Shinto and Buddhism), influence from abroad, and other artistic developments in literature, music, and theatre.

ARTh 313 Chinese Painting  3 Credit Hours
This course is a survey of the painting of China from the earliest examples found in tombs through works influenced by the West during the modern period. The course focuses on selected artists who serve as representatives of major traditions of China's cultural and artistic heritage. Students will be introduced to Chinese philosophy and relevant literary genres that provide a context for the development of Chinese painting.

ARTh 315 Early Chinese Art and Archaeol  3 Credit Hours
An examination of the art and architecture of early China (Neolithic through Eastern Han). Recent excavations that have significantly changed our view of the early period will be given emphasis. Students will analyze relevant literary and philosophical texts in translation to enhance understanding of the cultural context. (OC).

ARTh 319 Egyptian Art  3 Credit Hours
The art of the Ancient world is examined through an intensive review of the visual traditions of Egypt: its monumental architecture, sculpture, painting and decorative artifacts. (AY).

ARTh 321 Greek Art  3 Credit Hours
This course surveys the history and art of Crete, the Cyclades, and Greece from the third millennium through the first century B.C. In the prehistoric period, the course will focus on both architectural and ceramic developments, as well as on the trade and economic contacts between Asia Minor and Greece. In the historic period, the course considers the major artistic developments in architecture, sculpture, and painting, focusing on how social, political or historical events caused these art forms to evolve and change over the centuries. (AY).

ARTh 322 Roman Art  3 Credit Hours
This course surveys the history and art of Crete, the Cyclades, and Greece from the third millennium through the first century B.C. In the prehistoric period, the course will focus on both architectural and ceramic developments, as well as on the trade and economic contacts between Asia Minor and Greece. In the historic period, the course considers the major artistic developments in architecture, sculpture, and painting, focusing on how social, political or historical events caused these art forms to evolve and change over the centuries. (AY).

ARTh 327 Gods, Myth and Worship  3 Credit Hours
Full Course Title: Gods, Myth and Worship in Classical Art- This course examines the way that gods, goddesses, heroes, and myths are depicted in Greek and Roman art, and how they were central to the religious and cultural life of these civilizations. We study the art, architecture, literature, and archaeology of ancient Greece and Rome as we explore how religious priorities, social needs, and political ideologies shaped the artistic choices behind the representational arts and oral figures and stories.

Prerequisite(s): ARTh 101 or ARTh 102 or ARTh 103 or ARTh 104 or ARTh 106
Prerequisite(s):

- patronage, placement, restoration, art criticism, women's roles in society

Background for the study of these works of art and architecture. Issues of Platonism, and Millenarianism provide the historical and intellectual quattrocento. The ideals of the Florentine Republic, Humanism, Neo-Platonism, and Millenarianism provide the historical and intellectual background for the study of these works of art and architecture. Issues of patronage, placement, restoration, art criticism, women's roles in society and reception will also be explored. (OC).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 331 Early Christian Byzant Art 3 Credit Hours

Borrowing its formal language from late antiquity and its symbolism from other mystery cults, the art of early Christianity emerged from the Roman catacombs to monumental expression under emperors Constantine and Justinian. (AY).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 332 Early Med and Romanesque Art 3 Credit Hours

A study of the dynamic interplay between barbarian, Christian and classical Mediterranean influences in the early Medieval period with a consideration of the art and architecture of the pilgrimage routes to Santiago de Compostela and of the crusader kingdoms in the Holy Land. (AY).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 333 Gothic Art and Architecture 3 Credit Hours

A survey of the architecture, sculpture and stained glass of the great cathedrals of Europe, focusing on Chartres, Amiens, Reims, and Bourges. A study of the patrons, builders, the new technology they employed and the cities in which they worked as well as an analysis of the emergence of naturalism in medieval manuscript illumination and panel painting. (AY).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 334 The 14th Century 3 Credit Hours

This is a course that examines the art and architecture of Europe in the 14th century: one of the great transitional periods in the history of western art. Beginning with the new developments in 13th-century Italian art by such artists as Giovanni Pisano and Giotto, the course charts the pattern of these developments in northern European countries as well. (OC).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 335 Women in Medieval Art 3 Credit Hours

Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women's roles in the creation and patronage of art and literature, economic and family issues, and women's participation in new and innovative forms of religious piety.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 341 Art & Arch in Early Ren Florence 3 Credit Hours

This course examines the city of Florence as a work of art, as well as masterpieces of Florentine sculpture, painting and architecture of the Early Renaissance (fifteenth century). Among the masters studied are the sculptors Nanni di Banco, Donatello, Ghiberti, Luca della Robbia, Pollaiuolo, and Verrocchio; the painters Masaccio, Fra Angelico, Fra Filippo Lippi, and Botticelli; and the architects Brunellscchi, and Alberti. Statuary, reliefs and tombs; altarpieces, fresco cycles and mythological pictures; churches and palaces are all studied within the context of the technical, philosophical, political and cultural developments of the quattrocento. The ideals of the Florentine Republic, Humanism, Neo-Platonism, and Millenarianism provide the historical and intellectual background for the study of these works of art and architecture. Issues of patronage, placement, restoration, art criticism, women's roles in society and reception will also be explored. (OC).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103

ARNTH 342 High Renaissance and Mannerism 3 Credit Hours


Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 343 Renaissance & Reformation Art 3 Credit Hours

This course surveys the religious and political forces that shaped art produced north of the Alps during the fifteenth and sixteenth centuries. Through the study of artworks by such masters as Van Eyck, Durer, and Bruegel, students examine the connections between art and devotional pracitives, the rise of secular imagery and humanism, and the impact of the art of Italy. Special attention is also given to the role that art played during the Protestant Reformation and to the development of printmaking.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 344 Italian Renaissance Sculpture 3 Credit Hours

A study of freestanding and relief sculpture during the Italian Renaissance, with particular attention to major artistic centers like Florence, Rome, and Venice in the 15th and 16th centuries. By examining such forms as colossal statuary, equestrian sculpture, tomb monuments, garden sculpture, and portrait busts, the course will address the function of art within the public sphere, the relationship between civic sculpture and political ideology, the re-elevation of sculpture from a mechanical art to a liberal art, and the role artistic individuality and technical proficiency. Artists addressed will include Donatello, Ghiberti, Verrocchio, Antico, Riccio, Bertoldo, Michelangelo, Cellini, and Giambologna.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 351 Southern Baroque Art 3 Credit Hours

A study of the art of the seventeenth century in Italy and Spain, focusing upon Caravaggio, Annibale Carracci, Guercino, Reni, Cortona, Gaulli, Murillo, Zurbaran, and Velasquez, among others. (OC).

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARNTH 352 Northern Baroque Art 3 Credit Hours

Study of the art of the seventeenth century in France, Flanders and Holland, with emphasis on Poussin, Georges de la Tour, the Le Nain brothers, Lebrun, Rubens, Van Dyck, Van Ruisdael, Vermeer, and Rembrandt. (OC).

ARNTH 360 Art of Glass 3 Credit Hours

This course focuses on glass as a medium and an art form. From Roman times to the present day, the unique qualities of glass have excited artists and craftsmen to make vessels, sculptures, and architectural ornamentation. The course traces the form and function of glassworks, focusing particularly on the historical trajectory of glass from ancient vessels and medieval stained glass, to the development of "art glass" in the nineteenth century, to contemporary objects. The course is based on lectures, discussion, and readings. Students are required to attend several field trips for "hands-on" work with objects. Enrollment is limited to 15 students.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
ARTH 361 American Art  3 Credit Hours
A study of American painting, sculpture, and architecture from the colonial period to the present. In this survey of an art tradition that has greatly depended upon developments in Europe, efforts will be made to identify what is American about American art. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 362 Impressionism and Post-Impressionism  3 Credit Hours
An examination of the origins of modern painting and sculpture in the art of the major Impressionists (Manet, Monet, Degas, Renoir) and Post-Impressionists (Cezanne, Seurat, Gauguin, Van Gogh). (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 363 Arts of the Twentieth Century  3 Credit Hours
A contextual study of twentieth-century art that seeks to define the relationships between western art and society. In addition to a consideration of painting, sculpture, and architecture, the emergence of new media - including altered and fabricated photography, video, and installation art - will be examined. Although a broad survey of a century rich in artistic achievements, the course will emphasize the dominance and influence of Pablo Picasso, Henri Matisse, and Frank Lloyd Wright. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 364 Picasso  3 Credit Hours
A critical examination of Pablo Picasso’s art that chronicles the artist’s achievements as a painter, sculptor, draftsman, printmaker, and ceramist. Lectures and readings are directed to positioning Picasso’s masterworks in relationship to his art as a whole and in the context of twentieth-century art. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 365 Modern Architecture  3 Credit Hours
A survey of European and American architecture from the Chicago School to Post-Modernism. The course will trace the stylistic history of modern architecture while considering parallel issues of theory, social context, and building technology. Major architects studied will be Sullivan, Wright, Mies van der Rohe, Le Corbusier, and Johnson. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 366 The Modern Print  3 Credit Hours
A history of western printmaking from Post-Impressionism to the present. The course will examine the relationship of printmaking to major movements of the day, the impact of modern technology on traditional print processes, and the developing notion of printmaking as an integral form of expression for the modern painter and sculptor. Special emphasis will be placed on the contributions of Gauguin, Munch, Picasso, Johns, and Stella. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 367 Contemporary Art  3 Credit Hours
An examination of the most recent developments in modern art. In addition to painting and sculpture, consideration will be given to related forms of expression in performance art, photography, and video. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 368 American Photography  3 Credit Hours
This course explores the history of photography, its aesthetics, and social functions in the United States, beginning with the medium’s emergence in the 1830s and concluding with contemporary practices. Lectures and discussions will attend to several threads of inquiry: the history and theory of the medium and its interpretation; the diverse functions of photographs in American society; the relationship between photography and American identity formation; and the status of the photograph in a post-photographic, digital age. (OC)

ARTH 375 Urban Design Perspectives  3 Credit Hours
This course explores the ways in which urban design both creates and reflects past and present urban conditions, cultures, and spatial relationships. The course will look at the built environment architecturally, aesthetically, and anthropologically in order to highlight the ever changing complexities of urban spheres. The placement and design of buildings and public spaces, and the resulting human interactions in those spaces, will be explored in comparative contexts.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 384 Islamic Architecture  3 Credit Hours
This course is a comprehensive study of history and development of Islamic architecture from its birth in the seventh century to the present time. The course is designed to explain major characteristics of Islamic architecture through the study and analysis of major monumental buildings both religious and secular: Mosques, Madrasas (schools), Mausoleums, Palaces, and other buildings. Detailed analysis also will be applied to different types of art associated with these buildings, such as wall painting, stucco work, wood carving, sculpture, mosaic, and calligraphy.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 105
Restriction(s):
Can enroll if Level is Undergraduate

ARTH 385 Islamic Decorative Arts  3 Credit Hours
This course is in an in-depth investigation of the decorative arts of the Islamic Middle East from the seventh through the eighteenth century including the lands of Islamic Spain and North Africa and extending east to Afghanistan. The course traces the development of decorative styles in objects of daily and courtly life, particularly ceramics, metal work, glass, wood and ivory carving, textiles and rugs. The central role played by calligraphy in all of the arts in emphasized as well as in manuscript production and the Arts of the Book. As a religion, but also a way of life, Islam fostered a distinctive artistic production reflected in these decorative arts.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106 or RELS 201

ARTH 390 Topics in Art History  3 Credit Hours
Examination of problems and issues in selected areas of art history. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when topics differ. (OC).

ARTH 399 Independent Studies  1 to 3 Credit Hours
Readings and research assignments in history of art selected in accordance with the special needs and interests of art history concentrators. May be repeated for a maximum of 6 credit hours. (FW).
ARTH 400  Senior Seminar  3 Credit Hours
An introduction to art-historical research methods. The art historian's central task of interpretation is explored by considering the critical perspectives of connoisseurship, iconography, formal analysis, iconology, and modern literary theory. (OC).
Prerequisite(s): (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 416 or ARTH 425 or ARTH 426 or ARTH 429 or ARTH 454) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 425 or ARTH 426 or ARTH 454)

ARTH 410  Museum Practice Seminar I  3 Credit Hours
Students conduct research on works of art in preparation for an exhibition and an accompanying catalogue. Students are exposed to all aspects of writing a catalogue and didactic texts, designing/installing the exhibition, and planning the exhibition opening.
Prerequisite(s): (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 400 or ARTH 411 or ARTH 425) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 425 or ARTH 426 or ARTH 454)

ARTH 411  Museum Practice Seminar II  3 Credit Hours
This course is an introduction to museum studies. Students explore the history and missions of museums, and the role of museums in shaping public discourses on art. They also study current issues related to museum practice, including collection development, repatriation of cultural property, conservation, administration, research, exhibition and interpretation. Field trips to area institutions are scheduled so students can meet museum and gallery professionals in order to consider career opportunities available in this context.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 416  Earl Mod Jpn Paint&Wood Pmts  3 Credit Hours
Paintings and woodblock prints of the Edo/Tokugawa (1600-1868) and Meiji (1868-1912) periods are considered in light of competing developments that on the one hand looked to Japan's classical tradition and on the other to the influence of art and artists from China and the West. Special attention is given to female artists and images of women. Students cannot receive credit for both ARTH 416 and ARTH 516. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103
Restriction(s):
Cannot enroll if Class is Graduate

ARTH 425  Women in Classical Antiquity  3 Credit Hours
This course examines the evidence for the lives of women in Greek, Etruscan and Roman Antiquity, from the Bronze Age through the Imperial Period. Special emphasis will be placed on the archaeological evidence, especially works of art which illustrate women's lives and their relationships with men. Documents such as dedicatory and funerary inscriptions, the poetry of Sappho and Sulpicia, and selections from the writings of Homer, Hesiod, Aristotle, Pliny, Juvenal, and other ancient authors, will also be examined critically, particularly in relationship to the works of art. Students cannot receive credit for both ARTH 425 and ARTH 525. (YR).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Cannot enroll if Class is Graduate

ARTH 426  City of Ancient Rome  3 Credit Hours
This course will focus on the ancient city of Rome, from its foundation to its precipitous decline in the fifth century AD. It will explore the public art and architecture of the city, emphasizing the different types of evidence available (topography, architecture, sculpture, texts) for understanding the history, politics, religion, and urban development of Rome, as well as the various art historical and archaeological techniques used to analyze the evidence. (OC)
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103

ARTH 427  Greek Architecture  3 Credit Hours
The architectural vocabulary established during the centuries of classical Greek civilization influences our culture to the present day. This course explores the history and development of this fundamental architectural tradition, focusing on the Greek temple, sanctuaries and holy sites, urban planning and public works, and domestic space. Students discuss the philosophical underpinnings of Greek architectural design, the engineering practices of Greek builders, as well as the cultural and social influences on Greek buildings and cities. This course begins with the emergence of humble mudbrick and timber buildings from the Dark Ages and continues through the height of cosmopolitan urban luxury in the 2nd century AD.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Cannot enroll if Class is Graduate

ARTH 428  Roman Art and Memory  3 Credit Hours
In this course, we examine Roman art closely associated with personal commemoration and cultural memory, including portraiture, funerary monuments, imperial monuments, and public architecture. We explore these objects’ relationship to Roman literary culture's theories of mnemotechnics, and in the social context of the Roman obsession with memory perpetuation. We also examine how art historians apply modern theories of collective and social memory in their scholarship on Roman art, creating new ways of understanding Roman sculpture, painting, and architecture. Finally, we investigate Roman spectacle and performance as a vehicle of cultural memory. Students cannot earn credit for both ARTH 428 and ARTH/LIBS 528.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Cannot enroll if Class is Graduate
ARTH 434  Renaissance and Baroque Rome  3 Credit Hours
The return of the papacy in 1420 initiated the reemergence of Rome as a major cultural center. This course examines painting, sculpture, architecture, and urban planning in Rome from the 15th to the 17th century, including the work of Raphael, Michelangelo, Bernini, Borromini, and Caravaggio. Topics to be explored include the birth of Renaissance archaeology and antiquarianism; humanism and the papal curia; urban renewal and conservation; pilgrimage and sacred topography; the "myth of Rome"; architecture of churches, villas, and palaces; tourism and the city as spectacle. This course is structured as a seminar that is writing and research-intensive.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 454  Rembrandt  3 Credit Hours
Rembrandt's paintings, drawings, and prints are considered in the full historical and cultural context of the Golden Age of the Northern Netherlands, a period of unprecedented wealth and cultural diversity. Special attention will be given to issues of style, iconography, biography, art criticism, gender, patronage and artistic technique. Students cannot receive credit for both ARTH 454 and ARTH 554. (YR).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Cannot enroll if Class is Graduate

ARTH 469  Collage, Montage, Assemblage  3 Credit Hours
Different conceptions of collage, montage, and assemblage have vitally shaped artistic practice in the twentieth century, perhaps even more so than the advent of modernist abstraction. The modern phenomenon of collecting, mixing, and sampling that permeates the last century up to and including the contemporary moment will be traced in the class across the thresholds of painting, sculpture, architecture, photography, and film. We will discuss a wide range of movements, genres, and styles (Cubism, Futurism, Surrealism, Dada, Weimar and Russian photomontage, Soviet film, found footage film, French decollage, postwar assemblage) and their relation to the ever-changing mass media, the urban, and the modernized - in short, the everyday. The last segment of the class addressed more recent interpretations of the collage paradigm, including installation art and digital applications. Student cannot receive credit for both ARTH 469 and ARTH 569.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

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Frequency of Offering
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Astronomy (ASTR)

ASTR 130  Introduction to Astronomy  3 Credit Hours
A one-term introduction for those interested in learning about the present state of knowledge of the Universe, its origin, evolution, organization, and ultimate fate. Exciting new discoveries concerning extrasolar planets, star birth, supermassive black holes, dark matter/dark energy, and cosmology are discussed. Two years of high school math or its equivalent recommended.

ASTR 131  Introductory Astronomy Lab  1 Credit Hour
An introduction to some of the important observational techniques and analytical methods used by astronomers. Ground-based and satellite data will be used to reveal physical and chemical properties of the moon, planets, stars, and the Milky Way. Outdoor exercises involving telescopic observation of the sun, variable stars, nebulae, and external galaxies are also included. Constellation identification will be taught using off-campus planetarium facilities.
Prerequisite(s): ASTR 130* or PHYS 130

ASTR 133  Search for Life in Universe  3 Credit Hours
Full Title: The Search for Life in the Universe A one-semester course on the scientific search for life throughout the Universe. The range of environments hospitable for life form an organizing principle by which to examine several aspects of modern Astronomy including, but not limited to: habitats in the Solar System; physical constraints on life and unusual chemistry; the Search for Extraterrestrial Intelligence and the Fermi Paradox. (F)

ASTR 301  Astrophysical Concepts  3 Credit Hours
A one-semester course introducing the Physical concepts used in Modern Astrophysics, with an emphasis on the application of these ideas to Astrophysical objects. The course familiarizes the student with the Astronomical concepts and vocabulary used in other Astronomy courses at the 300-level and beyond. The course begins with an overview of Astronomical objects and terminology, before introducing conservation laws in Physics and their applications in Astronomy. Newtonian mechanics and gravity are then introduced and applied to various self-gravitating systems and scenarios. Electromagnetism, Quantum Mechanics and a small amount of Statistical Physics are covered at sufficient detail to understand the behavior of electromagnetic radiation and thermal emission. Special and General relativity are introduced from the point of view of understanding the behaviors of certain exotic objects in Astronomy. Common statistical distributions used in upper-level Astronomy courses are also introduced with an emphasis on application.
Prerequisite(s): (MATH 114 or MATH 116) and (PHYS 126 or PHYS 151)
Restriction(s):
Can enroll if Level is Graduate or Undergraduate
Can enroll if College is Education, Health, and Human Services or Arts, Sciences, and Letters or Business or Engineering and Computer Science

ASTR 330  The Cosmic Distance Scale  3 Credit Hours
An exploration of the cosmic distance ladder focusing on the systems and techniques that astronomers use in establishing the distances to celestial objects. Direct measures using radar ranging and trigonometric parallax will be discussed for objects in the solar system and for stars within about 3000 light-years of the Sun, respectively. For more remote systems in or just outside the Milky Way, methods based spectroscopic parallax and the period-luminosity relation for various types of variable stars will be introduced. For the extra-galactic objects, use of the Hubble relation and the light curves of Type Ia supernovae will be made to assess the distances. At each rung of the ladder, emphasis will be placed on the astrophysical principles and processes underlying the methodology being applied. 3 hours lecture
Prerequisite(s): (MATH 113 or MATH 115) and (PHYS 126 or PHYS 151)
ASTR 361 Observational Techniques 3 Credit Hours
This course is designed to provide students with an understanding of some of the basic observational techniques used by astronomers in gathering and analyzing data from celestial objects. Practical experience in acquiring, displaying, and interpreting optical and radio observations using the University's 0.4-m telescope and 2.3-m radio dish will be emphasized. Topics will include astronomical coordinate system and timekeeping, telescope optics, the design and use of CCD detectors, fundamentals of multi-color photometry, an introduction to astronomical spectroscopy, and radio measurements of the Sun and interstellar hydrogen clouds at 21-cm wavelengths. (2 hours lecture, 3 hours laboratory)
Prerequisite(s): (ASTR 130 or PHYS 130) and (PHYS 126 or PHYS 151)

ASTR 390 Topics in Astronomy 3 Credit Hours
A lecture in a topic of current interest in astronomy. Topics vary and are announced in the current Schedule of Classes. Three hours lecture.
Prerequisite(s): ASTR 130 or PHYS 130

ASTR 390A Topics in Astronomy 3 Credit Hours
Topic: Dark Matter, Dark Energy, Dark Future? An Introduction to 21st Century Cosmology. Modern cosmology, buttressed by increasingly precise observational data provided by space missions like HST, COBE, and WMAP, teaches that the universe is composed primarily of matter we cannot see nor properly characterize, the so-called 'dark matter,' and of energy whose source is unknown and may defy knowing, the ubiquitous 'dark energy.' This course will attempt to elucidate what we currently understand about the composition, structure and evolution of the universe based on general relativistic theory and astronomical observations of remote galaxies using both ground- and space-based technologies. Special attention will be given to the means by which important cosmological parameters that determine the structure of the universe, like the critical density, the Hubble parameter, and the curvature and cosmological constants, are established. If time permits, additional consideration will be given to the array of planned future space missions devoted to cosmology-related subjects.
Prerequisite(s): PHYS 305

ASTR 421 Stellar Astrophysics 3 Credit Hours
An application of important physical principles to stars and star clusters. Topics will include gravitational collapse and star formation, radiative transfer and stellar atmospheres, nucleosynthesis and the structure of normal stars, degeneracy and the endpoints of stellar evolution, and general relativistic effects in the vicinity of black holes. 3 hour lecture.
Prerequisite(s): (PHYS 305 or ASTR 301 or ASTR 330) and (MATH 205 or MATH 215)

ASTR 445 Galaxies and Cosmology 3 Credit Hours
A course devoted to our current understanding of the composition, structure, and evolution of the universe based on general relativistic theory and astronomical observations of remote galaxies using both ground- and space-based technologies. Topics include observational characteristics, classification, kinematics and evolution of galaxies, quasars and active galactic nuclei, the cosmic microwave background radiation, concepts of general relativity, single-and multi-component models of the universe, dark matter and dark energy, and the origin of the universe (the big bang, inflation and the creation of the first elements). Three hour lecture. (AY)
Prerequisite(s): (PHYS 305 or ASTR 301 or ASTR 330) and (MATH 114 or MATH 116)

ASTR 498 Directed Studies in Astronomy 1 to 3 Credit Hours
Special topics in astronomy chosen by mutual agreement between the student and the instructor. Course may be repeated for credit. (F, W, S)

ASTR 499 Research in Astronomy 1 to 3 Credit Hours
Observational/experimental studies in astronomy selected by agreement between the student and the instructor. Four to twelve hours laboratory/independent study. May be repeated for credit. (F, W, S)

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Behavioral and Biological Sciences (BBS)
Biochemistry (BCHM)

BCHM 210  Biochemistry Laboratory Techniques  2 Credit Hours
Biochemical Laboratory Techniques in an introduction to the equipment, procedures, and concepts used in the biochemistry laboratory. The class will cover topics such as scientific literature, keeping a laboratory notebook, statistical analysis and computer programs, as they relate to biochemistry. (W,YR)
Prerequisite(s): CHEM 134 or CHEM 144 and CHEM 136 or CHEM 146 and BIOL 140
Restriction(s):
Can enroll if Major is Biochemistry

BCHM 352  Introduction to Toxicology  3 Credit Hours
An introduction to the principles of toxicology with an emphasis on environmental toxicology. Major topics include toxic agents, toxicological mechanisms, and use of toxicological reference literature. Discussion of chemical carcinogenesis, genetic toxicology, immunotoxicology, teratology, and toxic responses of the skin, eyes, and nervous system. Three hours lecture. (AY).
Prerequisite(s): CHEM 225

BCHM 370  Principles of Biochemistry  3 Credit Hours
A concise but comprehensive survey of various areas of biochemistry designed for non-biochemistry majors. The course follows the standard approach to the subject including a description of cells, their structure and constituent macromolecules (proteins, nucleic acids, carbohydrates and lipids), enzymology, bioenergetics, intermediary metabolism, and gene regulation. Students cannot take both Biochemistry 370 and 470 or 471 for any combination of concentration, cognate or minor requirement. Three hours lecture. (AY).
Prerequisite(s): CHEM 225

BCHM 390  Current Topics in Biochemistry  1 to 3 Credit Hours
Special topics current to the field of biochemistry. Topics and format for the course may vary. See Schedule of Classes for current topic. Permission of instructor. (OC).
Prerequisite(s): (BCHM 370* or BIOL 370* or CHEM 370*) or (BCHM 470* or BIOL 470* or CHEM 470*)

BCHM 404  Mech. Chronic Human Disease  3 Credit Hours
This course focuses on the biochemical, molecular and cellular mechanisms underlying the progression of chronic diseases, such as diabetes mellitus and atherosclerosis. Techniques in epidemiology, pathology, genetics, molecular biology, and biochemistry are used to understand how relevant physiological processes become pathological. The examination of chronic diseases provides an opportunity to understand biological processes across many scales of life, from extracellular matrix proteins to cells in blood vessel walls to risk factors in patient populations to the pharmacology of treatments. Use of primary literature is emphasized. Three hour lecture.
Prerequisite(s): BIOL 301 or BIOL 306 or BIOL 357 or BCHM 370 or BIOL 370 or CHEM 370 or BCHM 471 or BIOL 471 or CHEM 471
Restriction(s):
Can enroll if Class is Junior or Senior

BCHM 430  Bioinorganic Chemistry  3 Credit Hours
This course examines the roles that metals play in biological systems, including the chemical principles that make metal ions well-suited for roles in protein structure, in redox catalysis and in acid base chemistry. The physical and experimental techniques that are applied to explore the structure and function of metals systems will be introduced using case studies from the primary scientific literature in the field. BCHM 370 or its equivalent are strongly recommended but not required.
Prerequisite(s): CHEM 136 and BIOL 140

BCHM 470  Biochemistry I  3 Credit Hours
Life processes from a chemical viewpoint: structure/function relationships of biomolecules with emphasis on proteins, enzyme kinetics, and mechanisms of action. Three hours lecture. (W).
Prerequisite(s): (BIOL 130 and BIOL 140 and CHEM 134) or (CHEM 144 and CHEM 136) or (CHEM 146 and CHEM 225)

BCHM 471  Biochemistry II  3 Credit Hours
Intermediary metabolism, bioenergetics, energy transformation, metabolic interrelationships, biochemical regulation, highly structured subcellular biochemical systems. Three hours lecture. (W).
Prerequisite(s): BCHM 470 or CHEM 470 or BIOL 470

BCHM 472  Biochemistry Laboratory I  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of proteins and nucleic acids. Physical and chemical properties of proteins and nucleic acids. Four hours laboratory. CHEM 344 Recommended. (F).
Prerequisite(s): (BCHM 470* or BCHM 470* or CHEM 470*) and CHEM 227

BCHM 473  Biochemistry Laboratory II  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of lipids and carbohydrates. Methods in metabolism. Four hours laboratory. (W).
Prerequisite(s): (BCHM 471* or BIOL 471* or CHEM 471*) and (BCHM 472* or BIOL 472* or CHEM 472*)

BCHM 474  Molecular Biology  4 Credit Hours
This course will emphasize the molecular biology of eukaryotes, and topics will include genome organization and complexity, chromatin structure and function, gene expression, DNA replication and repair, genetic rearrangements, and the molecular biology of development. The laboratory will emphasize the application of recombinant DNA technology to the study of biological problems. Three hours lecture, four hours laboratory. (W).
Prerequisite(s): BCHM 470 or CHEM 470 or BIOL 470 or (BCHM 370 or BIOL 370 or CHEM 370) and CHEM 227
Corequisite(s): BCHM 474L

BCHM 480  Biochemical Pharmacology  3 Credit Hours
Pharmacology is a study of drugs. In this course, the biochemical and molecular basis of drug action will be emphasized. Different categories of drugs, their use, abuse, and side effects will be presented. Three hours lecture. Permission of instructor. (OC).
Prerequisite(s): CHEM 370 or BCHM 370 or BIOL 370 or CHEM 470 or BIOL 470

BCHM 485  Nutrition and Metabolism  3 Credit Hours
Full Course Title: The Biochemistry of Human Nutrition and Metabolism Human Nutrition and Metabolism is an introduction to the relationship between food and nutrients, and their integration in the metabolic pathways. An understanding of the molecular basis of nutrition, related diseases, and overall health will be built on previous knowledge of cell biology and biochemistry. (AY)
Prerequisite(s): (BCHM 471 or BIOL 471 or CHEM 471) or (BCHM 370 or BIOL 370 or CHEM 370)
BCHM 490  Topics in Biochemistry  1 to 3 Credit Hours
A course in special topics that examines research problems of current interest in biochemistry. Topics and format may vary. See current Schedule of Classes. One to three hours seminar. (W).

BCHM 495  Off-Campus Research in Biochem  1 to 3 Credit Hours
Participation in ongoing research at an off-campus laboratory. No more than 6 hours combined from any Natural Science courses numbered 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F,W,S).

BCHM 496  Complex Systems  3 Credit Hours
Full Title: Biochemistry Capstone: Complex systems in Biochemistry
A complex system is defined as a system featuring a large number of interacting variables whose combined activity is non-linear and whose seemingly random behavior leads to self-organization. Current topics ** are used to explore how complex systems function in biology. All reading material in the class are taken from the scientific literature giving students a chance to become familiar with how biochemists convey ideas and report their findings. Each student will present a paper to the class to demonstrate the ability to communicate concepts of Biochemistry effectively. Students will also learn the process of proposal writing and will have the opportunity to research and write their own proposal and have it peer-reviewed by their classmates. **The topics for this course will change each year, depending on the instructor, and the focus of current advances in Biochemistry/Complex systems. (W,YR)
Prerequisite(s): BCHM 470 and BCHM 472 and BCHM 474
Restriction(s):
Can enroll if Class is Senior

BCHM 497  Seminar in Biochemistry  1 Credit Hour
A seminar course that examines research problems of current interest in biochemistry. The course format may include training students to read and present scientific papers, guest lecturers, and lectures by the instructor on a selected topic. One hour seminar. Permission of instructor. (W).
Prerequisite(s): (BCHM 470 or BIOL 470 or CHEM 470) and (BCHM 474 or BIOL 474)

BCHM 498  Directed Reading in Biochem  1 to 3 Credit Hours
Library research in a specific area of biochemistry performed under the direction of a faculty member. No more than six hours combined from departmental courses numbered 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours readings. Permission of instructor. (F,W,S).

BCHM 499  Laboratory Research in Biochem  1 to 3 Credit Hours
Directed laboratory research performed under the supervision of a faculty member. Research training is encouraged. No more than six hours combined from departmental courses numbered 495, 498, and 499 may be credited toward the 120 hours required for graduation. Four to twelve hours laboratory. Permission of instructor. (F,W,S).

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Bioengineering (BENG)

BENG 325  Thermofluid for Bioengineering  4 Credit Hours
This course is an introduction into mass and heat transport phenomena in biomedical systems. Basic mechanisms of fluid flow, heat transfer, and diffusion are presented and applied to biological objects (cells, tissues, organisms) and biomedical devices. Topics include mass, momentum, and energy conservation laws, physical properties of common and biological fluids, elements of fluid statics, control volume analysis, basics of fluid mechanics, conduction and convection heat transfer, diffusion, applications to hyper- and hypothermia, thermal ablation, and cryopreservation, basics of mass and heat transfer in the body.
Prerequisite(s): ENGR 216 and ME 230 and (ME 265 or ME 345)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

BENG 351  Bio-Sensors & Instrumentation  4 Credit Hours
The course covers measurements in biological materials using a variety of sensor technologies along with electronic instrumentation design and use. Safety and FDA requirements are also presented.
Prerequisite(s): (MATH 216 or MATH 228) and BIOL 103 and BIOL 140 and ECE 305 and (ENGR 216 or ECE 270)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 364  Prob&Stat in Bioengineering  3 Credit Hours
Set theory, combinatorial analysis, probability and axioms, random variables, continuous and discrete distribution functions, expectations, Chebyshev’s inequity, weak law of large numbers, central limit theorem, sampling statistics and distributions, point and interval estimation, and linear regression.
Prerequisite(s): MATH 116 or MATH 114 or Mathematics Placement with a score of 215
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

BENG 370  Biomechanics I  4 Credit Hours
The course provides a basic understanding of how the human body functions as a mechanical system. Review of mechanics. Musculoskeletal anatomy, statics and kinematics, muscle force redundancy, joint mechanics. Bone and soft tissue mechanics, muscle active force generation. Implant stress shielding and impact safety. Laboratory experiments directed at rehabilitation engineering, biological bone and tissue property measurement, bone and implant structural analysis, and impact safety.
Prerequisite(s): (ME 265 or ME 345) and (MATH 216 or MATH 228)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

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Bioengineering (BENG)
BENG 375  Biomaterial Tissue Engr  4 Credit Hours
The course provides a basic understanding of the structure, properties and therapeutic applications of biomaterials, as well as the opportunities and scientific and technological challenges of tissue engineering. It also provides an integrated and multidisciplinary biological-engineering approach and probes mechanisms and methods of evaluation of tissue/biomaterials and patient/device interactions. Further the course assesses current outcomes, current challenges and cutting edge technological solutions to medical problems, Laboratory topics include key biological concepts, clinical safety, tissue culture, biological cells/bioactive materials interaction, and scaffold testing.  
Prerequisite(s): ENGR 250 and BIOL 140
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

BENG 381  Bioprocessing  4 Credit Hours
This course will introduce the students to the field of bioprocessing where the engineering concepts are applied to convert raw materials to pharmaceuticals, chemicals and food using biological processes. Discussions will include application of bioprocess-engineering knowledge in designing, building, controlling, and operating the biologically driven processes. Typical applications include bioreactor design, material collection and scale-up considerations. The course will also introduce the pharmacokinetics and pharmacodynamics analysis concepts to the students and will serve as an introductory course to teach how to use these concepts to design bioprocess-engineering systems. 4 credit hours (3 credit hours of lecture and 1 credit hour of lab).
Prerequisite(s): (ME 325 or BENG 325) and BIOL 140 and CHEM 136
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 410  Bioinformatics  3 Credit Hours
This course covers fundamental computer skills for using various bioinformatics tools, querying bioinformatics databases, computational approaches and analysis methods for biological problems, and introduction to various programming languages and toolboxes for bioinformatics, data mining, and data visualization.
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 425  Transport in Biosystems  3 Credit Hours
The course introduces transport phenomena in biological and medical systems to students already familiar with basic thermal-fluid sciences. Topics include properties of body fluids and cell membranes, blood flow and solute and oxygen transport in biological systems, basic principles of pharmacokinetic analysis, transport phenomena in medical devices and artificial organs.  
Prerequisite(s): ME 375 or BENG 325
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 426  Fundamentals of Drug Delivery  3 Credit Hours
This course will provide the students with an advanced understanding of the principles behind drug delivery and focus on rational design of drug delivery devices and depots. An in-depth understanding of the design and development of various drug delivery devices and depots will be discussed. Various types of drug and gene delivery routes including transdermal, implantable, targeted, and pulmonary will be discussed. Biotransport is also critical to the development and proper functioning of drug delivery depots and medical devices. Students will apply conservation principles and constitutive laws that govern heat, mass, and momentum transport processes and systems that are encountered in typical drug delivery problems.  
Prerequisite(s): BENG 325 and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 450  Biomedical Optics and Biophotonics  3 Credit Hours
Full Course Title: Biomedical Optics and Biophotonics The recent explosion of interest in minimally invasive medical diagnostics has been fueled in part by the development of novel optics and photonics techniques and instrumentation designed specifically for medical applications. A large number of optically-based imaging and sensing diagnostics are now in use in both the research laboratory and medical clinic. Topics include engineering design principles of optical instrumentation for medical diagnostics, elastic and inelastic light scattering theory and biomedical applications, confocal and multiphoton microscopy, light propagation and optical tomographic imaging in biological tissues, and design of minimally invasive spectroscopic diagnostics. (YR)
Prerequisite(s): PHYS 150 and PHYS 151
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if Major is Bioengineering.

BENG 451  Microfluidics  3 Credit Hours
Microelectromechanical systems (MEMS) have been developed for a wide range of applications from automotive to medical devices, and microfluidics extends these technologies to biological assays. Microfluidics and bioMEMS have a particular usefulness in biological applications due to their small volumes, low energy sensing, and minimal force actuators. Novel bioMEMS and microfluidics leverage techniques in biophysics, biochemistry, solid state devices, and polymer engineering to advance device developments.
Prerequisite(s): (BENG 325 or ME 325) and (BENG 375 or BENG 381)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters
BENG 460  Nanobiosystems Engineering  3 Credit Hours
Nanobiosystems Engineering is an emerging frontier in nanotechnology. It integrates materials science, bioengineering, physics and life science with the biological and biochemical applications. This fast-developing interdisciplinary field holds the promise to solve many of the medical problems of future. The course will introduce advanced concepts related to nanomaterials and nanofabrication and their application in medicine. The course will also focus on design and development of nanodevices for the applications of pharmaceuticals and healthcare. Typical applications include nano-biosensor, targeted drug delivery, and tissue engineering will also be discussed. Students in Bioengineering will have a chance to present and discuss individual application through team project.
Prerequisite(s): (ME 325 or BENG 325) or (ME 349 or BENG 351 and BENG 375)
Restriction(s):
- Can enroll if Class is Junior or Senior
- Can enroll if Level is Undergraduate
- Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 4671  Senior Design  4 Credit Hours
A guided design project course where student teams propose design projects, design a device, system or process related to bioengineering and conduct evaluative experiments and/or construct a physical prototype. Engineering ethics and responsibility. At the end of the semester, the students are required to submit written reports and give oral presentations with a demonstration of their projects.
Prerequisite(s): BENG 325 and BENG 351 and BENG 370 and (BENG 375 or BENG 381) and BENG 364
Restriction(s):
- Can enroll if Class is Junior or Senior
- Can enroll if Major is Bioengineering

BENG 470  Advanced Biomechanics  3 Credit Hours
The course covers intermediate level subject matter on structural biomechanics, analysis and design. Topics include: soft tissue biomechanics, human motion analysis including gait, orthopedic implants, fixation and reconstruction, head impact and injury, advanced bone models. (YR)
Prerequisite(s): BENG 370
Restriction(s):
- Can enroll if Class is Junior or Senior
- Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 475  Regenerative Eng  3 Credit Hours
This course will discuss principles of tissue engineering whereby the properties of stem as well as primary cells, growth factors, and extracellular matrix and their impact in the development of engineered tissue constructs will be explored. In addition, the course will also focus on supporting/enabling technologies typically utilized in engineering these constructs including nano- and micro-fabrication techniques, 3D printing, micro-patterning as well as designing principles of bioreactors, and drug and gene delivery techniques. Additionally, various tissue engineering applications will be discussed including synthetic tissues and organs that are currently under development for regenerative medicine application.
Prerequisite(s): BENG 370 and BENG 375
Restriction(s):
- Can enroll if Class is Junior or Senior
- Can enroll if Level is Undergraduate
- Can enroll if College is Engineering and Computer Science

BENG 481  Biomimetics  3 Credit Hours
The Biomimetic Engineering course will give an overview and in-depth analysis of nature’s solutions to specific problems with the aim of determining appropriate engineering analogs. Students will learn mechanical principles in nature and their application to engineering devices. Mechanical behavior of biological materials as governed by underlying microstructure will be discussed. Students will work in teams on projects where they will take examples of designs, concepts and models from biology and determine their potential in specific engineering applications. 3 credit hours
Prerequisite(s): (ME 325 or BENG 325) and (BENG 370 or ME 345)
Restriction(s):
- Can enroll if Class is Junior or Senior
- Can enroll if Level is Undergraduate
- Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 490  Directed Design Project  1 to 3 Credit Hours
Design project involving not only design by alson analysis, fabrication, and/or testing. Topics may be chosen from any of the areas of bioengineering. The student will need to submit a report on his or her project at the end of the term. (F, S, W)
Restriction(s):
- Can enroll if Class is Senior
- Can enroll if Major is Bioengineering

BENG 492  Guided Study in Bioengineering  1 to 3 Credit Hours
Individual study, design, or laboratory research in a field of interest to the student. Topics may be chosen from any areas of Bioengineering. The student needs to submit a report on his or her project at the end of the term. (F, S, W)
Restriction(s):
- Can enroll if Class is Senior
- Can enroll if Major is Bioengineering

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Biological Science (BIOL)

BIOL 100  Principles of Biology  3 Credit Hours
A lecture course introducing non-science concentrators to major areas of biology, including cell biology, genetics, human physiology, plant biology, ecology, and evolution. Topics of current interest are discussed. Students cannot use both BIOL 100 and NSCI 120 to satisfy the Natural Sciences distribution requirements. Three hours lecture. (F, W).
BIOL 103  Anatomy and Physiology I  4 Credit Hours
The structural and functional relationships of the human body at the cellular, tissue, organ, and system levels are analyzed. Students identify the major anatomical parts and relate these to the physiological activities of the circulatory, skeletal, nervous, muscular, and digestive systems. The homeostatic effects of fluids, electrolytes, and acids and bases throughout the integrated human body are analyzed. Four hours lecture, three hours laboratory. (F).
Corequisite(s): BIOL 103L

BIOL 105  Anatomy and Physiology IIA  4 Credit Hours
The major anatomical parts of the cardiovascular, respiratory, reproductive, endocrine, nervous, and urinary systems of the human body are identified and related to the physiological activities of these systems. Emphasis is placed on the homeostatic effects of fluids, electrolytes, acids, and bases throughout the integrated human body. Four hours lecture, three hours laboratory. (W)
Prerequisite(s): BIOL 103
Corequisite(s): BIOL 105L

BIOL 130  Intro Org and Environ Biology  4 Credit Hours
An introduction to organismal and environmental biology, with emphasis on plant and animal diversity, structure, physiology, and development; ecology; and evolution. This course complements BIOL 140, which need not be taken as a prerequisite; together they constitute an introduction to biology. This course is intended for science concentrators. Three hours lecture, four hours laboratory/recitation. (F,W,S).
Corequisite(s): BIOL 130L

BIOL 140  Intro Molec & Cellular Biology  4 Credit Hours
An introduction to molecular and cellular aspects of biology with emphasis on cell structure and function, biochemistry, genetics, cell growth, and the origin of life. This course complements BIOL 130; together they constitute an introduction to biology. This course is intended for science concentrators. Three hours lecture, four hours laboratory/recitation.
Prerequisite(s): CHEM 134* or CHEM 144*
Corequisite(s): BIOL 140L

BIOL 240  Great Experiments in Biology  3 Credit Hours
An individualized-learning course that portrays the development of modern biological science. The course does not require attendance in classes since it can be completed at home and in the library by means of study guides, audio cassettes, slide/tape presentations, and computer-assisted instruction. (F,W,S).

BIOL 242  Great Experiments Laboratory  1 Credit Hour
An individualized-learning laboratory science course that can be completed at home. Historically important and model experiments are performed in order to demonstrate how hypotheses are drawn and tested. Data are analyzed at a computer terminal. (F,W,S).
Prerequisite(s): BIOL 240*

BIOL 290  Topics in Biology and Society  3 Credit Hours
An introduction to themes of biology reflecting the interaction between biology and society. Topics vary and are announced in the current Schedule of Classes. The course may be repeated no more than once under a different topic. Three hours lecture. (OC).

BIOL 291  Biology and Society Laboratory  1 Credit Hour
A laboratory course to accompany BIOL 290. Three hours laboratory. (OC).
Corequisite(s): BIOL 290

BIOL 301  Cell Biology  4 Credit Hours
Functional and structural features of cells, organelles, and macromolecules. Topics in biochemistry, and physical chemistry of cellular processes are considered. Three hours lecture, four hours laboratory. CHEM 226 is recommended. (W).
Prerequisite(s): BIOL 140
Corequisite(s): BIOL 301L

BIOL 303  Comparative Animal Physiology  4 Credit Hours
Physiological processes and their control in higher animals. Emphasis ranges from the cellular mechanisms and systemic patterns of regulation of body functions to the evolutionary and environmental adaptations determining body form and function in diverse animal types. Three hours lecture, four hours laboratory. MATH 114 is recommended. (F).
Prerequisite(s): BIOL 130 and BIOL 140 and (CHEM 124 or CHEM 134 or CHEM 144)
Corequisite(s): BIOL 303L

BIOL 304  Ecology  4 Credit Hours
Relationships between organisms and their environments. Patterns in the physical environment, physiological and behavioral adaptations, population dynamics, energy flow, nutrient cycling; succession. Three hours lecture, four hours laboratory (with field trips). (F, S).
Prerequisite(s): BIOL 130 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 116)
Corequisite(s): BIOL 304L

BIOL 305  Anatomy and Physiology IIB  4 Credit Hours
The major anatomical parts of the cardiovascular, respiratory, reproductive, endocrine, nervous, and urinary systems of the human body are identified and related to the physiological activities of these systems. Emphasis is placed on the homeostatic effects of fluids, electrolytes, acids, and bases throughout the integrated human body. Students complete additional work beyond what is required in BIOL 105. Four hours lecture, three hours laboratory.
Prerequisite(s): BIOL 103
Corequisite(s): BIOL 305L

BIOL 306  General Genetics  3 Credit Hours
An intermediate course in classical, molecular and evolutionary genetics. The structure, function, and inheritance of genetic material in prokaryotes, eukaryotes and viruses are discussed. Topics include DNA and chromosome structure, genetic linkage and mapping, gene expression and its regulation, human genetic disease, and population genetics. Three hours lecture, one hour recitation. (F).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 306R

BIOL 306R  General Genetics Recitation  0 Credit Hours
Recitation component of BIOL 306. Must be taken concurrently with BIOL 306.
Corequisite(s): BIOL 306

BIOL 307  General Genetics Laboratory  1 Credit Hour
A semester-long laboratory course dealing with investigation and analysis in genetics. Laboratory sessions will include genetic crosses of plants and animals and the subsequent analysis to determine linkage and gene mapping location. Computer exercises will also be used to establish genetic tools for modern molecular analysis. Four hours laboratory. (W).
Prerequisite(s): BIOL 306*
BIOL 309 Introduction to Mycology 4 Credit Hours
An introduction to the biology of the fungi. Classification, structure, industrial use, gastronomic qualities, and disease-producing ability of macroscopic and microscopic forms are studied. Laboratories include microscopic and macroscopic examinations of fungi and their growth and field studies on the occurrence and classification of edible and poisonous varieties. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 130 and BIOL 140

BIOL 310 Histology 4 Credit Hours
Descriptive approaches to the study of the microscopic anatomy of animal tissue. The course emphasizes the study of cell and tissue types, selected organs and the interpretation of electron micrographs. Three hours lecture, four hours laboratory. (AY, F).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 310L

BIOL 311 Embryology 4 Credit Hours
Descriptive and experimental approaches to a comparative study of reproduction, morphogenesis, and growth. Emphasis is placed on the vertebrates, but some attention is focused on the development of invertebrates and plants. Three hours lecture, four hours laboratory. (AY, W).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 311L

BIOL 313 Plant Taxonomy and Systematics 4 Credit Hours
Characteristics, distribution, and relationships of plants with special reference to the local Michigan flora. Three hours lecture, four hours laboratory (including field work) per week. (OC).
Prerequisite(s): BIOL 130
Corequisite(s): BIOL 311L

BIOL 315 Aquatic Ecosystems 4 Credit Hours
An introduction to the physical, chemical, and biological characteristics of lakes, rivers, and wetlands emphasizing a comparison of ecosystem structure and function. Laboratory emphasizes data collection and analysis to characterize a representative lake, river, and wetland. Lecture and laboratory. (AY, F).
Prerequisite(s): BIOL 130 and CHEM 124 or GEOL 118

BIOL 320 Field Biology 4 Credit Hours
Adaptations, taxonomy, systematics, ecology, and behavior of southeastern Michigan flora and fauna. Techniques of field observation and recording are emphasized. Skills in the use of identification keys and guides are developed. The campus Environmental Study Area is used intensively. Three hours lecture, four hours laboratory (with field trips). (S).
Prerequisite(s): BIOL 101 or BIOL 130 or NSCI 120 or NSCI 233

BIOL 324 Invertebrate Zoology 4 Credit Hours
This course introduces students to the diversity of invertebrate animals from a functional evolutionary perspective. The lecture will focus on the unique aspects of the morphology, physiology, and ecology of major phyla in light of the selective forces that have favored their evolution, as well as consider the intersection of invertebrates and humans. Through dissection, prepared slides and field observations, the laboratory will introduce the diversity of invertebrate phyla and subgroups, with emphasis on form and function.
Prerequisite(s): BIOL 130

BIOL 333 Plant Biology 4 Credit Hours
A thorough survey of the evolutionary trends in plant reproduction and morphology will be considered. This survey will extend into the field of plant anatomy, but not plant physiology, which is covered in a separate course. Major groups to be studied include: bacteria, algae, fungi, liverworts, lichens, mosses, ferns, and seed plants. Certain less familiar groups will also be emphasized. Plant diversity will be examined from the perspective of its import to civilizations of the past and future. Three hours lecture, four hours laboratory. (F, S).
Prerequisite(s): BIOL 130
Corequisite(s): BIOL 333L

BIOL 335 Plant Physiology 4 Credit Hours
Physiological principles as they apply to the major plant groups. Topics include cellular metabolism, water balance, translocation, photosynthesis, mineral nutrition, growth and development and production of secondary substances. Three hours lecture, four hours laboratory. (W).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 335L

BIOL 337 Plant Ecology 3 Credit Hours
This course focuses on different aspects of the relationship between plants and their environment. Topics include: a) interactions of plants with the physical environment; b) ways in which the environment acts to shape plant populations through evolution; c) intra- and interspecific interactions among individuals; and d) large-scale patterns and processes at the landscape-level. Three hours lecture.
Prerequisite(s): BIOL 130

BIOL 350 Introduction to Neurobiology 4 Credit Hours
An introduction to nervous systems and how they function. This course includes the cellular physiology and anatomy of nervous systems in vertebrates and invertebrates, and how these cellular activities are integrated into systems to produce complex, coordinated behavior. Three hours lecture. (W).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 350L

BIOL 352 Endocrinology 3 Credit Hours
This class will provide intermediate and advanced undergraduates with a basic understanding of the function of the endocrine system. The course will progress from a consideration of basic concepts and mechanisms to the physiology (function) of specific endocrine systems. Interactions between organ systems will also be emphasized. Specific sections of the course will focus on function of the endocrine system during stress, fluid balance, metabolism (including calcium, glucose, lipid, and proteins), reproductive growth, development, and aging.
Prerequisite(s): BIOL 140 and BIOL 130 and CHEM 134

BIOL 353 Ornithology 3 Credit Hours
A study of the unique features of birds as representatives of vertebrates, including their morphology, anatomy, physiology, physics of flight, mating systems, social structure, vocalizations, orientation and migration, origin and evolution, growth and development, and issues in avian conservation. Students learn about the current research on bird migration at the Rouge River Bird Observatory on campus. Students develop individual species analysis of life and natural histories. Three hours lecture.
Prerequisite(s): BIOL 130
**BIOL 357** Human Physiology  3 Credit Hours
Systems of the human body and their function are investigated individually and as part of an integrated natural living system. Topics include cell structure and function of nerves, muscles, the lungs, heart, blood vessels, kidneys, digestive tract, endocrine glands, brain, and reproductive organs.

**Prerequisite(s):** (BIOL 130 and BIOL 140) or (BIOL 103 and BIOL 105)

**BIOL 360** Population Genetics & Evolutn  3 Credit Hours
Processes which change the genetic composition of populations: mutation, gene flow, genetic drift, and natural selection. The origin of subspecies, species, and higher taxa. Evidence of evolution from the geological record, comparative anatomy, comparative biochemistry and other sources. Three hours lecture. (FW)

**Prerequisite(s):** BIOL 130 and BIOL 140 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 116)

**BIOL 361** Population Genetics & Evol Lab  1 Credit Hour
A laboratory course to accompany BIOL 360. Four hours laboratory. (OC).

**Prerequisite(s):** BIOL 360*

**BIOL 370** Principles of Biochemistry  3 Credit Hours
A concise but comprehensive survey of various areas of biochemistry designed for non-biochemistry majors. The course follows the standard approach to the subject including a description of cells, their structure and constituent macromolecules (proteins, nucleic acids, carbohydrates and lipids), enzymology, bioenergetics, intermediary metabolism and gene regulation. Students cannot take both BCHM 370 and 470 or 471 for any combination of concentration, cognate or minor requirement. Three hours lecture. (F).

**Prerequisite(s):** BIOL 140 and CHEM 226

**BIOL 380** Epidemiology  3 Credit Hours
Introduces the methods for infectious disease epidemiology (occurrence and spread in population) and case studies of important disease syndromes and entities. Methods include definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness. Case-studies focus on acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria, and other vector-borne diseases. This course emphasizes methods of study that would contribute to understanding diseases etiology.

**Prerequisite(s):** BIOL 140

**BIOL 381** Biotechnology & Bioprocessing  4 Credit Hours
Biotechnology and Bioprocessing class is centered on the study of bioengineering applications found today in the medical and agricultural industries. Students use microorganisms, plant and animal tissue culture, and enzymes during the laboratory period, practicing the fundamentals of “hands-on” genetic engineering and material processing. Students establish and purify proteins from recombinant organisms. Besides technology, ethical and environmental concerns are discussed in the lecture. Three hours lecture, four hours laboratory.

**Prerequisite(s):** BIOL 140

**BIOL 385** Microbiology  4 Credit Hours
The biology of microorganisms is considered through study of the properties of bacteria, fungi, algae, protozoa, and viruses. Microbial structures are discussed and correlated with their function. Aspects of cellular metabolism pertinent to microorganisms are emphasized. The interaction of microorganisms and their environment, animate and inanimate, is discussed with respect to the beneficial or harmful effects of the different microbial groups. Laboratory exercises introduce the student to basic, practical microbiological techniques and illustrate various principles of microbial life. Three hours lecture, four hours laboratory. (F,S).

**Prerequisite(s):** BIOL 140 and (CHEM 134* or CHEM 144*)

**Corequisite(s):** BIOL 385L

**BIOL 390** Topics in Biology  1 to 4 Credit Hours
Examination of problems and issues in selected areas of biology. Title in Schedule of Classes changes according to content. This course may be repeated for credit when specific topics differ. Permission of Instructor. (OC).

**BIOL 402** Physiology of Excitable Cells  3 Credit Hours
An in-depth analysis of the mechanisms underlying electrical communication within and between mammalian cells. The major emphasis is on excitable cells in the brain, heart, and skeletal muscle and their functional integration. Fulfills the Biology major capstone requirement.

**Prerequisite(s):** BIOL 130 and BIOL 140 and (BIOL 303 or BIOL 305 or BIOL 350)

**Restriction(s):**
Can enroll if Class is Senior

**BIOL 404** Mech. Chronic Human Disease  3 Credit Hours
This course focuses on the biochemical, molecular and cellular mechanisms underlying the progression of chronic diseases, such as diabetes mellitus and atherosclerosis. Techniques in epidemiology, pathology, genetics, molecular biology, and biochemistry are used to understand how relevant physiological processes become pathological. The examination of chronic diseases provides an opportunity to understand biological processes across many scales of life, from extracellular matrix proteins to cells in blood vessel walls to risk factors in patient populations to the pharmacology of treatments. Use of primary literature is emphasized. Three hour lecture.

**Prerequisite(s):** BIOL 301 or BIOL 306 or BIOL 357 or BCHM 370 or BIOL 370 or CHEM 370 or BCHM 471 or BIOL 471 or CHEM 471

**Restriction(s):**
Can enroll if Class is Senior

**BIOL 405** Applied & Environ Microbiology  4 Credit Hours
The study of the diversity, structure and function of microorganisms as they interact with their environment. Emphasis will be placed on soil microbiology (fungi, bacteria, microalgae) and plant-microbe interactions (pathogens, symbioses). Ecological topics include decomposition, nutrient cycling, bioremediation and agroecosystems. Three hours lecture, four hours laboratory. (W).

**Prerequisite(s):** BIOL 385 or MICR 385

**Restriction(s):**
Can enroll if Class is Senior

**BIOL 406** Microbial Genetics  3 Credit Hours
This molecular genetics course emphasizes bacteria and viruses. Topics include chromosome structure and replication, recombination, DNA repair, genetic mapping, mechanisms of gene transfer, regulation of gene expression, and mutagenesis. Three hours lecture. (W, YR)

**Prerequisite(s):** MICR 385 or BIOL 385
BIOL 410  Diversity Issues Health Care  3 Credit Hours
This course will address the effect of race, age, gender, religion, and economic status on medical research and health care. Through an examination of clinical trials and case studies, students will learn how medical research is performed in the United States, and what health care treatments and options for patients are available. Medical treatment and disease topics will be selected and will be evaluated as to how they are influenced by the criteria listed. The examples will focus on both cultural differences and inequity, in national and global settings. (AY).
Prerequisite(s): BIOL 130 and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior

BIOL 412  Vertebrates  5 Credit Hours
A comparative study of the morphology of living animals, including an analysis of structural and functional features, diversity, and macroevolution. The major emphasis is on the comparative functional anatomy of living vertebrates. Three hours lecture, eight hours laboratory. Fulfills the biology major capstone requirement. This course was formerly offered as 312; students cannot receive credit for both BIO 312 and 412. (W, AY)
Prerequisite(s): (BIOL 303 or BIOL 305 or BIOL 335) or BIOL 360
Restriction(s):
Can enroll if Class is Senior

BIOL 414  Limnology  4 Credit Hours
The study of the structural and functional relationships and productivity of organisms in lakes and streams as they are regulated by their physical, chemical and biotic environments. Laboratories will emphasize field study of area lakes and streams. Three hours lecture, four hours laboratory. BIOL/ESCI 304 or ESCI 275 recommended.
Prerequisite(s): BIOL 130 and (CHEM 136 or CHEM 146)
Corequisite(s): BIOL 414L

BIOL 416  Stream Ecology  4 Credit Hours
A study of the physical, chemical and biological characteristics of streams and rivers. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304

BIOL 419  Behavior and Evolution  3 Credit Hours
An in depth examination of how evolutionary processes shape behavior, focusing on the influence of natural, sexual, and kin selection. Topics include behavioral genetics, natural selection, sexual selection, kin selection, optimality, game theory, evolutionary stable strategies, phylogenetics, and the comparative method.
Prerequisite(s): BIOL 140 and BIOL 130
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

BIOL 420  Advanced Field Ecology  4 Credit Hours
An intense study of behavioral ecology and field-oriented research at an advanced level, utilizing ecological habitats on campus and in surrounding urban areas. Focus will be on plant/animal interactions and will include pollination ecology, reproduction and distribution ecology, optimal foraging theory, as well as hypothesis testing of animal migration and distribution of species in extreme urban environments. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304 or BIOL 320
Restriction(s):
Can enroll if Class is Senior

BIOL 422  Conservation Biology  3 Credit Hours
This course is a study of the historical and current preservation of global biodiversity. The value of biodiversity, extinction, threats to biodiversity, and both ex situ and in situ conservation strategies are considered. (W, AY)
Prerequisite(s): BIOL 304 or ESCI 304
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

BIOL 424  Biology of Spiders  4 Credit Hours
An introduction to the biology of spiders and related arachnids. Lectures include spider anatomy, natural history, ecology, and evolution. Laboratory work includes specimen preparation, use of dichotomous keys, spider behavior, field methods, rearing and collecting techniques, and identification of spiders and their webs. Three hours lecture, four hours laboratory. Students cannot receive credit for both Biology 424 and Biology 524.
Prerequisite(s): BIOL 130
Restriction(s):
Cannot enroll if Class is Graduate

BIOL 430  Medical Virology  3 Credit Hours
A general description of the history and nature of animal virus disease. Emphasis is placed on the pathogenesis and clinical description of specific diseases.
Prerequisite(s): BIOL 385 or MICR 385

BIOL 440  Micro Genetics & Physi Lab  1 Credit Hour
This course emphasizes the use of advanced microbiological techniques for understanding the genetics and physiology of microorganisms. Experiments focus on the understanding of general microbial phenomena, such as nutrition, metabolism and biochemistry; protein and nucleic acid synthesis; energy generation, enzyme regulation, membrane transport, motility, differentiation, cellular communication and the behavior of populations.
Prerequisite(s): BIOL 385* or MICR 385* or BIOL 301* or BIOL 406* or MICR 406* or MICR 485* or MICR 485*
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

BIOL 450  Virology  4 Credit Hours
The first half of this course deals with bacterial viruses, with emphasis on classical events in this field. The second half surveys the field of animal viruses, with emphasis on recent discoveries, including replication, pathogenesis, and viral association with cancers. Three hours lecture, four hours laboratory. (AY).
Prerequisite(s): CHEM 226 and (MICR 385 or BIOL 385)

BIOL 452  Med & Env Toxicology  3 Credit Hours
Mechanistic concepts of toxicology at the cellular and molecular levels. The course is taught from a human health perspective focusing on contemporary problems and environmental associations. Three hours lecture. (W, AY)
Prerequisite(s): BIOL 140 and CHEM 225 and (BIOL 370 or BIOL 470 or BIOL 301)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
BIOL 455  Immunology  4 Credit Hours
A detailed study of the field of immunology. Among the topics covered are various aspects of the immunological response, such as humoral or cell-mediated immunity, cell-cell interactions, and immunology as related to the cause and prevention of disease. Three hours lecture, four hours laboratory. (AYF).
Prerequisite(s): BIOL 385 or BIOL 301 or MICR 385

BIOL 456  Behavioral Biology  4 Credit Hours
This course uses evolutionary and ecological theory to evaluate behavioral adaptations of organisms to their environment. Topics discussed include game theory, kin selection, sexual selection, eusociality, orientation and navigation, and signal evolution. Laboratory sessions include: observations of animal behavior, required manipulations of live animals, and field trips. Three hours of lecture, one four-hour laboratory. Students cannot receive credit for both BIOL 456 and BIOL 556. Student seeking graduate credit should elect BIOL 556.
Prerequisite(s): BIOL 130
Restriction(s):
Cannot enroll if Class is Specialist or Graduate or Doctorate

BIOL 459  Pathogenic Microbiology  4 Credit Hours
An introduction to pathogenic microorganisms and mechanisms of microbial pathogenicity. Disease-causing bacteria, fungi, viruses, and protozoa are studied. Laboratories emphasize clinical approaches to isolation, identification, and treatment. Three hours lecture, four hours laboratory. (AYF).
Prerequisite(s): BIOL 385 or MICR 385

BIOL 470  Biochemistry I  3 Credit Hours
Life processes from a chemical viewpoint: structure/function relationships of biomolecules with emphasis on proteins, enzyme kinetics, and mechanisms of action. Three hours lecture. (W)
Prerequisite(s): (BIOL 130 and BIOL 140 and CHEM 134) or (CHEM 144 and CHEM 136) or (CHEM 146 and CHEM 225)

BIOL 471  Biochemistry II  3 Credit Hours
Intermediary metabolism, bioenergetics, energy transformation, metabolic interrelationships, biochemical regulation, highly structured subcellular biochemical systems. Three hours lecture. (F).
Prerequisite(s): BCHM 470 or BIOL 470 or CHEM 470

BIOL 472  Biochemistry Lab I  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of proteins and nucleic acids. Physical and chemical properties of proteins and nucleic acids. Four hours laboratory.
Prerequisite(s): (BIOL 470* or BCHM 470* or CHEM 470*) and CHEM 227

BIOL 473  Biochemistry Laboratory II  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of lipids and carbohydrates. Methods in metabolism. Four hours laboratory. (W).
Prerequisite(s): (BCHM 471* or BIOL 471* or CHEM 471*) and (BCHM 472 or BIOL 472 or CHEM 472)

BIOL 474  Molecular Biology  4 Credit Hours
This course will emphasize the molecular biology of eukaryotes, and topics will include genome organization and complexity, chromatin structure and function, gene expression, DNA replication and repair, genetic rearrangements, and the molecular biology of development. The laboratory will emphasize the application of recombinant DNA technology to the study of biological problems. Three hours lecture, four hours laboratory. (W).
Prerequisite(s): (BCHM 470 or BIOL 470 or CHEM 470) or (BCHM 370 or BIOL 370 or CHEM 370) and CHEM 227
Corequisite(s): BIOL 474L

BIOL 476  Cancer Cell Biology  3 Credit Hours
Cancer is a disease of anti-social cell behavior. This course educates students on the genetics, molecular and cellular changes that normal cells undergo to become cancer cell. Major emphasis is on providing a mechanistic insight into fundamental questions in cancer cell biology. The course also discusses currently available therapeutic treatments and emerging issues in cancer therapy research. Fulfills capstone requirement for biology majors. Three hours lecture.
Prerequisite(s): BIOL 130 and BIOL 140 and (BIOL 301 or BIOL 306 or BIOL 370 or BCHM 370 or CHEM 370 or BIOL 385 or MICR 385)
Restriction(s):
Can enroll if Class is Senior

BIOL 485  Physiology of Micro-organisms  3 Credit Hours
An in-depth examination of the physiology of microorganisms. Areas of emphasis include the growth and nutrition of microorganisms, the development of viruses, the microbial degradation of organic compounds, the regulation of degradation reactions, and the biosynthesis of uniquely microbial compounds and secondary metabolites, such as antibiotics and toxins. Consideration is given to the natural environments of specific microorganisms. Three hours lecture. (W, YR)
Prerequisite(s): (BIOL 385 or MICR 385 or BIOL 370* or CHEM 370 or BCHM 370) and CHEM 225*

BIOL 489  Origins of Biological Sciences  3 to 4 Credit Hours
A study of the development of the science of biology as revealed in the writing and experiments of major biologists of the past and present. (OC).

BIOL 490  Sem in Biology/Microbiology  1 to 6 Credit Hours
Directed research on a problem culminating in the preparation of a paper and presentation of a public seminar. Tutorials, lectures and student seminars are given on selection and formulation of research problems, experimental design, and statistical treatment of data. May be repeated for credit with permission of advisor. (OC).

BIOL 491  Capstone Course in Biology  3 Credit Hours
A culminating course for biology majors which focuses on an area of current biological research and integrates material from different subdisciplines of biology. Topic varies and is announced in the Schedule of Classes. Three hours lecture.
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is Biological Sciences

BIOL 492  Capstone Research Experience  3 Credit Hours
An approved research experience with a UM-D biology faculty member which integrates material from different subdisciplines of biology. Research results are reported in a poster or seminar presentation or in a manuscript submitted for publication.
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is Biological Sciences
BIOL 493 Capstone Teaching Experience 3 Credit Hours
An approved teaching experience which integrates material from different subdisciplines of biology. Students work as a student teaching assistant/student mentor in the laboratory portion of a biology course.
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is Biological Sciences

BIOL 494 EMRAP 2 to 3 Credit Hours
Full Course Title: Emergency medicine Research Associates Program (EMRAP) at St. Mary Mercy Hospital. This course provides a unique research experience through a partnership between the University of Michigan-Dearborn Department. In the context of assisting with ongoing clinical research programs, enrolled students will learn the basic principles behind clinical research design, hypothesis testing, and results interpretation, including discussion of issues involving human subjects in research, informed consent and health information privacy. Students will gain knowledge in the aforementioned areas through lecture and through clinical shift work, including clinical provider shadowing, participant enrollment, and data collection for several ongoing clinical trials within the ED. This course runs for a full academic year (3 credits in fall and 2 credits in winter). (F,W,YR)

BIOL 495 Off-Campus Research Participat 1 to 3 Credit Hours
Participation in ongoing experimental research at an off-campus laboratory (or in the field). Arrangements made between the off-campus researcher, the student, and the Biology concentration advisor. No more than six credit hours combined from BIOL 490, 495, 498, and 499 may be counted toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of instructor. (F,S).

BIOL 497 Seminar in Biology 1 Credit Hour
Topics of current interest in Biology will be presented by guest lecturers, faculty members or students. Topics chosen will vary from term to term. Can be elected up to three times. One hour seminar. (W).

BIOL 498 Independent Study in Biology 1 to 3 Credit Hours
Library research and independent study performed under the guidance of a faculty member. Four to twelve hours readings. Permission of instructor. (F,S).

BIOL 499 Laboratory in Biological Resh 1 to 3 Credit Hours
Directed laboratory research performed under the guidance of faculty member. Four to twelve hours laboratory. Permission of instructor. (F,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Business Administration (BA)

BA 100 College of Business Foundation 1 Credit Hour
Business Foundations provides an introduction to a variety of topics critical to student success. Topics presented in this class include an overview of the Bachelor of Business Administration, on-campus resources available to ensure student success, academic advising, internships, student organizations, business communication, team membership, and academic integrity.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior
Cannot enroll if Major is

BA 210 Intro to Applied Creativity 3 Credit Hours
This is a course designed for undergraduate students that is aimed at improving their understanding of creativity and creativity problem solving. In addition, students will develop skills and learn methodologies, useful in a variety of contexts, to enhance personal and organizational creativity. Topics include: exploring the need for creativity, identifying specific creative challenges, methodologies to enhance personal and organizational creativity, and applying creativity to daily situations.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

BA 300 Career Planning & Develop 1 Credit Hour
This course focuses on providing students with the necessary skills to achieve their career goals. Topics include: laying the groundwork to selecting a career, developing job search correspondence, developing job search techniques, developing a networking strategy, developing interviewing skills, asking for references and recommendations, and evaluating and negotiating job offers. Students will be required to develop a job skills portfolio which will include documentation evidencing the application of these skills.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Business
Cannot enroll if Major is

BA 305 College to Career Coaching 0 Credit Hours
This course focuses on providing students with an ongoing process to help them develop and apply the skills and knowledge necessary to achieve their career goals. Through this course, eligible BBA students in the College of Business will have the opportunity to work, one on one, with an experienced career coach to enable them to successfully launch their career strategy upon graduation from the BBA program. Coaches actively partner with our students in a thought provoking and creative process that inspires them to maximize their personal and professional potential that helps bridge the gap between classroom knowledge and the realities of the business world.
Prerequisite(s): BA 300 or BI 350 or BI 355
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Business
Cannot enroll if Major is Prebusiness
BA 320  Proj Mgmt & Leadership Skills  3 Credit Hours
This course is intended to be a writing intensive problem based interdisciplinary course in project management skills. Topics covered will include benefits of project management, definition of a project, development of a project plan, execution of a plan, and management of change. Leadership skills will be emphasized as they relate to conflict resolution, motivating and coaching team members and listening to team members. Students will complete and present a project plan using the appropriate project management and presentation software.
Restriction(s):
Can enroll if Class is Junior or Senior

BA 330  Managerial Communication  3 Credit Hours
This course is designed to improve the student’s ability to communicate effectively within an organizational setting. Communication theory, strategies, techniques and skills that are essential for success in the business environment will be examined. Specific objectives during the semester will be to examine and improve managerial writing ability and to enhance interpersonal communication skills.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Can enroll if Class is Junior or Senior

BA 400  Corporate Responsibility  3 Credit Hours
The focus of this writing intensive interdisciplinary course will be on examining the responsibility, if any, that business should have as part of the solution to the challenges of globalization. As part of this examination, the course will focus on corporate responsible behavior and its relationship to corporate governance and maximizing shareholder value. The ethical, business, and legal cases as they relate to corporate responsible behavior in the areas of human rights, labor, environment, and corruption will be examined.
Prerequisite(s): COMP 280 or COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior
Cannot enroll if Level is Graduate

BA 480D  Entre& Comm: Doing Bus in Det  3 Credit Hours
This entrepreneurship class addresses innovation, creativity, and the commercialization process to explore the implementation and feasibility of new business ideas. Topics include opportunity recognition, creativity and design thinking, market assessment, strategic and financial planning. Students will be exposed to resources from urban areas including speakers with experience and expertise in the entrepreneurial community. Students will use events and organizations like Detroit SOUP or Start Garden to understand urban business needs and idea generation. From there they will work in teams developing an understanding of creative thinking, innovation, market assessment and effective communication of business and commercialization opportunities while taking a business idea through an iterative process toward market realization.
Restriction(s):
Can enroll if Class is Junior or Senior

BA 490  Research: Bus Administration  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit.
Restriction(s):
Can enroll if College is Business

BA 491  Bus Experiential Learning  3 Credit Hours
Full Course Title: Business Experiential Learning To provide an undergraduate student with the opportunity to undertake a business experiential learning project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the department chair of the college a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the experiential learning project. The department chair will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. (F,W,S)

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Business Economics (BE)

BE 401 Managerial Economics 3 Credit Hours
This intermediate level course presents price theory with business applications. Topics include consumption utility theory, production and cost theory, market structures and pricing strategies. Statistical estimation techniques of economic models are presented as well as modern elaborations of price theory. (YR).
Prerequisite(s): ECON 202 and ECON 201 and (MATH 104* or MATH 113* or MATH 115* or Mathematics Placement with a score of 115 or MATH 105*)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

BE 403 Business Conditions Analysis 3 Credit Hours
This course prepares business students to evaluate domestic and global economic conditions, including the influences that business conditions abroad have on conditions here in the United States and how financial market conditions and crises influence the business environment. The course focuses on how decision makers in business can use an understanding of the economic environment to make better decisions.
Prerequisite(s): ECON 201

BE 487 Seminar: Business Economics 1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

BE 497 Research: Business Economics 1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Business Internship (BI)

BI 350 Business Internship 3 Credit Hours
The internship provides full-time, paid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and other paperwork at the end of each work assignment and participate in an evaluative session with the internship staff.
Restriction(s):
Can enroll if College is Business

BI 355 Part-Time Business Internship 1 Credit Hour
The internship provides part-time, paid and unpaid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and other paperwork at the end of each work assignment and participate in an evaluative session within the internship staff. (A maximum of 6 credit hours of internship course work may be applied toward elective graduation requirements.)
Prerequisite(s): BA 300
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Degree is Bachelor of Business Admin
Can enroll if College is Business

BI 360 Business Internship 0 Credit Hours
This internship provides full or part-time, paid and unpaid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and other paperwork at the end of each work assignment and participate in an evaluative session with the internship staff.
Prerequisite(s): BA 300
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if Degree is Bachelor of Business Admin
Can enroll if College is Business

BI 450 Business Internship II 3 Credit Hours
The internship provides full-time, paid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and other paperwork at the end of each work assignment and participate in an evaluative session within the internship staff.
Prerequisite(s): BI 350

BI 455 Part-Time Bus Internship II 1 Credit Hour
The internship provides part-time, paid and unpaid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and other paperwork at the end of each work assignment and participate in an evaluative session within the internship staff. (A maximum of 6 credit hours of internship course work may be applied toward elective graduation requirements.)
Prerequisite(s): BI 355
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Degree is Bachelor of Business Admin
BI 460  International Business Intern  1 to 3 Credit Hours
The internship allows flexibility to engage in applied practical work experience outside of the United States, through paid or unpaid and full or part time work experiences. Participating organizations hire students within parameters set by the Internship Office throughout their experience. Students are required to submit reports, evaluation documents and participate in an assessment session with the internship staff. Students are responsible for their own legal, housing and transportation issues. This course will satisfy general elective credit.
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Business
Cannot enroll if Major is Prebusiness

BI 470  Business Internship III  3 Credit Hours
The internship provides full-time paid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students will have an increasing level of responsibility and application of academic knowledge, or students will be involved with application of new academic knowledge. Students are required to submit a report and other paperwork at the end of the work assignment and participate in an evaluative session with the internship staff.
Prerequisite(s): BI 450
Restriction(s):
Can enroll if College is Business
Cannot enroll if Major is Prebusiness

BI 475  Part-Time Bus Internship III  1 Credit Hour
The internship provides part-time paid and unpaid business experience for students in a formal, monitored program. Participating employers hire students within parameters set by the internship program. Students will have an increasing level of responsibility and application of academic knowledge, or students will be involved with application of new academic knowledge. Students are required to submit a report and other paperwork at the end of each work assignment and participate in an evaluative session within the internship staff. (A maximum of 6 credit hours of internship course work may be applied toward elective graduation requirements.)
Prerequisite(s): BI 455
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Degree is Bachelor of Business Admin

* An asterisk denotes that a course may be taken concurrently.

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Business Policy and Strategy (BPS)

BPS 441  Small Business Management  3 Credit Hours
This course explores the fundamental processes of starting and managing a small business; it will survey a number of business disciplines required to effectively manage small enterprises. Topics covered include modes of business entry, business planning, customers & marketing, and managing growth. The course will culminate in the development and presentation of a comprehensive business plan for a new or small business. (YR)
Prerequisite(s): BA 320 and BA 330 and ACC 299

BPS 451  Strategic Management  3 Credit Hours
This course is intended to be a comprehensive and integrative capstone course for the undergraduate business student. The central focus of this course is strategic management as opposed to the functional orientation that the student has experienced in most of his/her previous courses. Emphasis is on strategy formulation and implementation. Topics covered include the analysis of a company's external and internal environment; the development of a strategic vision and organizational objectives; the design of strategy at the functional, business, corporate, and international levels; and the creation of the organizational structure, operational policies and procedures, and reward systems.
Prerequisite(s): FIN 401 and (MIS 310 or ITM 310 or ACC 380) and OB 354 and MKT 352 and OM 300
Restriction(s):
Can enroll if Class is Senior
Can enroll if Degree is Bachelor of Business Admin

Chemistry (CHEM)

CHEM 090  Introduction to Chemistry  3 Credit Hours
An introductory course in chemistry stressing fundamental principles of chemistry and the application of mathematics to chemistry and problem-solving. Topics will include chemical formulas and equations, stoichiometry, descriptive inorganic chemistry, behavior of gases and atomic structure. Students with high school chemistry and three years of high school mathematics should elect CHEM 114. Three hours lecture. (F).

CHEM 091  Introduction to Chemistry II  3 Credit Hours
The course is designed for the Chemistry 134/144 student whose background in chemistry is inadequate for success in 134/144. This course will be offered concurrently with Chem 090 (Introduction to Chemistry). It will begin after the first Chem 134/144 exam and will encompass the final nine weeks of the term. Topics will include chemical formulas and equations, stoichiometry, descriptive inorganic chemistry, behavior of gases, and atomic structure.
CHEM 100  Chemistry and Society  4 Credit Hours
An introductory course for nonscientists that examines the way chemistry impacts our world. The course will focus not only on what modern chemistry has accomplished, but more generally on the way scientists think and how they function. Selected topics include (a) air and water pollution, ozone layer, global warming, acid rain, and other environmental chemistry; (b) the chemistry of plastics and polymers; (c) the chemistry of drugs and medicines; and (d) biotechnology and genetic chemistry. Other topics include the influence of the media on scientific issues and the decision-making process in science. Three hours lecture, three hours lab. (YR).

CHEM 124  General Chemistry I  4 Credit Hours
An introduction to phenomena and principles of chemistry with emphasis on developing an understanding of the fundamentals of chemical processes. Concepts to be explored are chemical reactions, thermodynamics, equilibria, and kinetics. For students considering careers in life sciences, physical sciences and engineering. Three hours lecture, one hour recitation, three hours laboratory. Prerequisites are one year of high school chemistry and previous or concurrent enrollment in MATH 104 or 105. (F,W,S).
Prerequisite(s): MATH 104* or MATH 105* or Mathematics Placement with a score of 113
Corequisite(s): CHEM 124L

CHEM 124L  Lab for Chem and Society  2 Credit Hours
Practical application of the concepts covered in CHEM 100. Three hours lab. (YR).

CHEM 134  General Chemistry IA  4 Credit Hours
An introduction to chemical phenomena and principles with an emphasis on developing both an understanding of chemistry and an appreciation of what chemists do. Students will investigate the fundamentals of chemistry in the context of real-world problems and will utilize systems of biological and environmental importance. Core concepts include stoichiometry, aqueous chemistry, gas laws, thermochmistry, atomic structure, molecular structure and bonding. Three hours lecture, one hour recitation, three hours laboratory. Primarily designed for students considering careers in life sciences or physical sciences. (F,W,S).
Prerequisite(s): MATH 104* or MATH 105* or MATH 113* or MATH 115* or Mathematics Placement with a score of 105 or Mathematics Placement with a score of 115

CHEM 136  General Chemistry IIA  4 Credit Hours
Continuation of CHEM 134. Concepts explored include conceptual and quantitative treatments of intermolecular forces, physical properties of solutions, chemical kinetics, chemical equilibria, acid-base equilibrium, thermodynamics, and electrochemistry. Primarily designed for students majoring in the physical sciences and the life sciences. (F,W,S).
Prerequisite(s): CHEM 134

CHEM 144  Gen Chemistry IB  4 Credit Hours
This course consists of an introduction to chemistry, its phenomena, and principles explored in the context of real-world examples (e.g. the automobile). Core concepts include states of matter, atomic and electronic structure, types of reactions (acid-base and reduction-oxidation), structure and bonding, gas laws, stoichiometry, thermodynamics, chemical equilibria, and the chemical composition of the atmosphere and air pollution problems. Three hour lecture, one hour recitation, three hours laboratory. Primarily designed for students considering careers in engineering. (F)
Prerequisite(s): MATH 105* or Mathematics Placement with a score of 113 or Mathematics Placement with a score of 115
Corequisite(s): CHEM 144L

CHEM 144L  Lab for Chem IB  2 Credit Hours
Practical application of the concepts covered in CHEM 144. The course consists of an introduction to chemistry, its phenomena, and principles explored in the context of real-world examples (e.g. the automobile). Core concepts to be explored include the solid state, chemical kinetics, electrochemistry and its applications (e.g. batteries, fuel cells, and corrosion), an introduction to organic functional groups, their reactions, and spectroscopic identification, and the preparation and properties of synthetic polymers. Primarily designed for students considering careers in engineering. (W)
Prerequisite(s): CHEM 144

CHEM 225  Organic Chemistry I  3 Credit Hours
The initial course in organic chemistry. A general introduction to organic chemistry with emphasis on the development of structure theory and functional group chemistry. Three hours lecture, one hour recitation. (F,S).
Prerequisite(s): CHEM 136 or CHEM 146
Corequisite(s): CHEM 225R

CHEM 225R  Organic Chemistry I Recitation  0 Credit Hours
Recitation component of CHEM 225. Must be taken concurrently with CHEM 225.
Corequisite(s): CHEM 225

CHEM 226  Organic Chemistry II  3 Credit Hours
A continuation of CHEM 225. Topics include functional group chemistry and properties of carbohydrates, amino acids, and aromatic compounds. Three hours lecture, one hour recitation. CHEM 225 and 226 constitute a two-semester sequence in organic chemistry, suitable for students in the basic sciences or engineering or with interests in one of the health professions. (W,S).
Prerequisite(s): CHEM 225
Corequisite(s): CHEM 226R

CHEM 226R  Organic Chemistry II Recitation  0 Credit Hours
Recitation component of CHEM 226. Must be taken concurrently with CHEM 226.
Corequisite(s): CHEM 226

CHEM 227  Organic Chemistry Laboratory  2 Credit Hours
Development of the basic laboratory techniques of organic chemistry. The chemistry of functional groups is studied and various organic compounds are synthesized and purified. Eight hours laboratory. (F,W,S).
Prerequisite(s): CHEM 226*

CHEM 228  Org Chem Lab for Chem/Bchm  2 Credit Hours
CHEM 228 incorporates chemical reactions and techniques for the synthesis, purification, and characterization of organic molecules. Students will conduct modern organic chemical experiments, collect data using modern instrumentation, analyze that data, and explain their reasoning in written and visual formats. Students will learn techniques to conduct multi-step synthesis, isolation, and purification of organic molecules and use modern techniques for molecular structure elucidation and to analyze pure samples and mixtures. This course is aimed at students majoring in chemistry or biochemistry. Students cannot receive credit for both CHEM 227 and CHEM 228. (F,W)
Prerequisite(s): (CHEM 134 and CHEM 136) or (CHEM 144 and CHEM 146) and CHEM 225 and CHEM 226*
Restriction(s): Can enroll if Major is Chemistry (ACS Certified), Biochemistry...
CHEM 230   Org Chem Lab for Chem/Bchm  2 Credit Hours
CHEM 230 incorporates chemical reactions and techniques for the synthesis, purification, and characterization of organic molecules. Students will conduct modern organic chemical experiments, collect data using modern instrumentation, analyze that data, and explain their reasoning in written and visual formats. Students will learn techniques to conduct multi-step synthesis, isolation, and purification of organic molecules and use modern techniques for molecular structure elucidation and to analyze pure samples and mixtures. This course is aimed at students majoring in chemistry or biochemistry. Students cannot receive credit for both CHEM 227 and CHEM 230. (FW)
Prerequisite(s): (CHEM 134 and CHEM 136) or (CHEM 144 and CHEM 146) and CHEM 225 and CHEM 226*

Restriction(s):
Can enroll if Major is Chemistry (ACS Certified), Biochemistry

CHEM 285   Introduction to Glass Blowing  1 Credit Hour
A study of the nature, properties, and manufacture of glass. Laboratory experience in the manipulation of glass and the construction of scientific apparatus. Discussions, laboratory, and field trips. (AY).

CHEM 303   Inorganic Chemistry I  3 Credit Hours
A study of the chemistry of the elements and their periodic relationship. Bonding theories and structures as well as descriptive chemistry of the representative elements will be emphasized. Three hours lecture. (F).
Prerequisite(s): CHEM 136 or CHEM 146

CHEM 325   Principles of Organic Chem  3 Credit Hours
A one-semester introduction to the compounds of carbon, with an emphasis on structure, preparation, reactivity and characterization of different functional groups. Both aliphatic and aromatic compounds will be examined. The important role of organic compounds in modern society will be highlighted with real world examples including fuels, detergents, plastics, medicines, biomolecules, environmental pollutants and additives. This course may not be used to satisfy the organic chemistry prerequisite for the Biochemistry, Biology, Chemistry, or Microbiology degree programs. Students may not receive credit for both CHEM 225 and 325. CHEM 325 may not be used as a prerequisite for Chemistry 226.
Prerequisite(s): CHEM 124 and (CHEM 136 or CHEM 146)
Restriction(s):
Cannot enroll if Major is Microbiology, Chemistry (ACS Certified), Chemistry (Instructional), Biochemistry, Biological Sciences

CHEM 344   Quantitative Analysis  4 Credit Hours
A survey of theory and practice of volumetric, gravimetric, electrometric and colorimetric analysis. Systematic analysis of complex materials. Two hours lecture, eight hours laboratory. (F).
Prerequisite(s): CHEM 136 or CHEM 146
Corequisite(s): CHEM 344L

CHEM 348   Environmental Chemistry  3 Credit Hours
Description of the concepts, principles, practices, and current problems in the chemistry of natural waters, the soil, and the atmosphere. Three hours lecture. (AY).
Prerequisite(s): CHEM 344 and (CHEM 225 or CHEM 325)

CHEM 349   Environmental Chem Laboratory  1 Credit Hour
Collection and analysis of air, water, soil, and organisms for pollutants such as noxious gases, heavy metals, and trace organics. EPA-approved methods are emphasized. Four hours laboratory. (AY).
Prerequisite(s): CHEM 348* or ESCI 348*

CHEM 352   Introduction to Toxicology  3 Credit Hours
An introduction to the principles of toxicology with an emphasis on environmental toxicology. Major topics include toxic agents, toxicological mechanisms, and use of toxicological reference literature. Discussion of chemical carcinogenesis, genetic toxicology, immunotoxicology, teratology, and toxic responses of the skin, eyes and nervous system. Three hours lecture. (AY).
Prerequisite(s): CHEM 225

CHEM 368   Physical Chemistry I  3 Credit Hours
Nature of the gaseous state, chemical thermodynamics, biochemical and chemical equilibria and kinetics. Three hours lecture, one hour discussion. (W).
Prerequisite(s): CHEM 225 and MATH 115 and (PHYS 125 or PHYS 150)

CHEM 370   Principles of Biochemistry  3 Credit Hours
A concise but comprehensive survey of various areas of biochemistry designed for non-biochemistry majors. The course follows the standard approach to the subject including a description of cells, their structure and constituent macromolecules (proteins, nucleic acids, carbohydrates and lipids), enzymology, bioenergetics, intermediary metabolism and gene regulation. Students cannot take both BCHM 370 and 470 or 471 for any combination of concentration, cognate or minor requirement. Three hours lecture. (F).
Prerequisite(s): BIOL 140 and CHEM 226

CHEM 390   Current Topics in Chemistry  1 to 3 Credit Hours
A course in special topics current to the field of chemistry. Topics and format for the course may vary. See current Schedule of Classes. One to three hours seminar. Permission of instructor. (OC).

CHEM 397   Current Topics in Chemistry  3 Credit Hours
A course for non-science majors which focuses on the interaction of chemistry and society. Sufficient chemical knowledge will be introduced so that the issues can be discussed and competing statements evaluated. Topics covered will include air and water pollution, fuels, designing drugs, etc. (OC).

CHEM 403   Inorganic Chemistry II  3 Credit Hours
A study of coordination and organometallic compounds through the use of current theories. The structure, reactivity, and descriptive chemistry of transition metal complexes will be examined. Three hours lecture. (W).
Prerequisite(s): CHEM 303 and (CHEM 368* or CHEM 468)

CHEM 426   Advanced Organic Chemistry  3 Credit Hours
Spectral analysis, structure determination, reaction mechanisms, synthesis, stereochemistry, and other selected topics are discussed. Three hours lecture. (AY).
Prerequisite(s): CHEM 226 and CHEM 227

CHEM 430   Bioinorganic Chemistry  3 Credit Hours
This course examines the roles that metals play in biological systems, including the chemical principles that make metal ions well-suited for roles in protein structure, in redox catalysis and in acid base chemistry. The physical and experimental techniques that are applied to explore the structure and function of metals in natural systems will be introduced using case studies from the primary scientific literature in the field. BCHM 370 or its equivalent are strongly recommended but not required.
Prerequisite(s): CHEM 136 and BIOL 140
CHEM 435  Green Chemistry  3 Credit Hours
An examination of green chemistry principles and methods used to assess and improve chemical processes with respect to environmental impact. Topics include: concepts of green chemistry, waste prevention, catalysis, renewable resources, alternative energy resources, and green technologies.
Prerequisite(s): CHEM 226 or CHEM 325
Restriction(s):
Cannot enroll if Class is Graduate

CHEM 436  Polymer Chemistry  3 Credit Hours
The macromolecular concept is introduced and polymerization mechanisms are discussed. The chemistry and physical properties of representative polymeric materials are presented. Topics include the determination and distribution of molecular weights, polymer morphology, mechanical properties of polymers, relaxation phenomena in polymers, and methods of polymer characterization. Three hours lecture. (AY).
Prerequisite(s): CHEM 226 and (CHEM 368* or CHEM 468)

CHEM 437  Nano-Biotechnology  3 Credit Hours
An introduction to the fundamentals of nanotechnology, nano-fabrication processes and its application in different fields with special attention to the life sciences. This course introduces different tools used in nontechnology and investigates how one can borrow the idea of self-assembly from nature to design structures at the nanometer scale. The course also focuses on different contemporary application areas of nanotechnology like biosensor development, cancer research and drug delivery. The research areas of selected companies that are applying nanotechnology to develop new products will also be explored. This course showcases the interchange of ideas between chemistry, materials science and engineering in solving complex biological problems.
Prerequisite(s): (CHEM 136 or CHEM 146) and (PHYS 126 or PHYS 151) and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior

CHEM 447  Instrumental Methods of Analysis  4 Credit Hours
A study of the theory, operation, and application of instrumental methods of chemical analysis including optical, magnetic, electrochemical, and separation techniques. Two hours lecture, eight hours laboratory. (W).
Prerequisite(s): CHEM 368* or CHEM 468

CHEM 450  Adv Org Syn & Character Lab  1 Credit Hour
Concepts and techniques from previous laboratory courses as well as advanced techniques are applied to synthesis and characterization of organic compounds. Spectroscopic and chromatographic data collection and interpretation are critical to success in the course. Formal writing and data presentation is emphasized. Oral presentation and a poster presentation is required. Crossover experiments with CHEM 452 are likely. Four hours laboratory. (W).
Prerequisite(s): CHEM 227 and CHEM 226 and CHEM 447 and CHEM 468
Corequisite(s): CHEM 452

CHEM 452  Adv Inorg Synth & Char Lab  1 Credit Hour
Concepts and techniques from previous laboratory courses as well as advanced techniques are applied to the synthesis and characterization of inorganic compounds. The ability to collect and interpret spectroscopic data is an important aspect of the course. Technical writing and data presentation is emphasized. Oral presentation and a poster presentation is required. Crossover experiments with CHEM 450 are likely. Four hours laboratory. (W)
Prerequisite(s): CHEM 226 and CHEM 227 and CHEM 136 and CHEM 403 and CHEM 447 and CHEM 481
Corequisite(s): CHEM 450

CHEM 456  Physical Chemistry II  3 Credit Hours
Nature of the liquid state, simple mixtures, heterogeneous equilibria; quantum theory, atomic and molecular structure, spectroscopy; statistical thermodynamics. Three hours lecture, one hour discussion. (F).
Prerequisite(s): CHEM 368

CHEM 470  Biochemistry I  3 Credit Hours
Life processes from a chemical viewpoint: structure/function relationships of biomolecules, with emphasis on proteins, enzyme kinetics, and mechanisms of action. Three hours lecture. (W).
Prerequisite(s): (BIOL 130 and BIOL 140 and CHEM 134) or (CHEM 144 and CHEM 136) or (CHEM 146 and CHEM 225)

CHEM 471  Biochemistry II  3 Credit Hours
Intermediary metabolism, bioenergetics, energy transformation, metabolic interrelationships, biochemical regulation, highly structured subcellular biochemical systems. Three hours lecture. (W).
Prerequisite(s): BCHM 470 or CHEM 470 or BIOL 470

CHEM 472  Biochemistry Laboratory I  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of proteins and nucleic acids. Physical and chemical properties of proteins and nucleic acids. Four hours laboratory. CHEM 344 Recommended. (F).
Prerequisite(s): (BIOL 470* or BCHM 470* or CHEM 470*) and CHEM 227

CHEM 473  Biochemistry Laboratory II  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of lipids and carbohydrates. Methods in metabolism. Four hours laboratory. (W).
Prerequisite(s): (BCHM 471* or BIOL 471* or CHEM 471*) and (BCHM 472* or BIOL 472* or CHEM 472*)

CHEM 481  Physicochemical Measurements  2 Credit Hours
Laboratory work including the determination of molecular weights, measurements of properties of pure liquids and solutions, studies of phase equilibria, thermochemical measurements, and analysis of atomic and molecular spectra. Eight hours laboratory. (W).
Prerequisite(s): CHEM 469*

CHEM 490  Topics in Chemistry  1 to 3 Credit Hours
Examination of problems and issues in selected areas of chemistry. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. One to three hours lecture. (YR).
Prerequisite(s): CHEM 226
 Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

CHEM 490D  Topics in Chemistry  3 Credit Hours
Topic: Bioinorganic Chemistry. Introduces the roles metals play in biological systems. Explores chemical principles that make metals particularly well suited for these roles. Introduces physical and experimental techniques used to explore the structure and function of metals in natural systems. Explores case studies from the literature to synthesize results of various experiments to develop a final understanding of the systems. Students will not receive credit for both CHEM 490D and 590B.
Prerequisite(s): CHEM 226 and BIOL 140
CHEM 493  Chemistry Capstone Portfolio  1 Credit Hour
Employment or graduate studies in chemistry involve integration of experiences and knowledge from one's undergraduate courses. This course is designed to help prepare students for their professional endeavors beyond UM-Dearborn. Students will submit a proposal for a senior project, present the completed project in an appropriate forum, and submit a written report on the project. Students will assemble and present a professional portfolio, and complete an exit interview. The experimental work on the project may be done in an advanced laboratory course or an independent study. (F, W).
Restriction(s):
Can enroll if Class is Senior

CHEM 495  Off-Campus Research Participat  1 to 3 Credit Hours
Participation in ongoing experimental research at an off-campus laboratory. Arrangements made between the research laboratory, the student and the chemistry concentration advisor. No more than six hours combined from CHEM 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F;W;S).

CHEM 497  Seminar in Chemistry  1 Credit Hour
Weekly seminars on topics of current chemical interest presented by faculty members, guest lecturers or students. The subject will vary from term to term. The course may be elected up to three times. One hour seminar. (W).
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate
Cannot enroll if Major is Chemistry (Instructional), Chemistry (ACS Certified)

CHEM 498  Readings in Chemistry  1 to 3 Credit Hours
Library research in a specific area of chemistry performed under the guidance of a faculty member. No more than six hours combined from CHEM 495, 498 and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours readings. Permission of instructor. (F;W;S).

CHEM 499  Laboratory Research in Chem  1 to 3 Credit Hours
Directed laboratory research performed under the guidance of a faculty member. No more than six hours combined from CHEM 495, 498 and 499 may be credited towards the 120 hours required for a degree. Four to twelve hours laboratory. Permission of instructor. (F;W;S).

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Chinese (CHIN)

CHIN 101  Beginning Chinese I  4 Credit Hours
First course in a two-course elementary Chinese sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in the Chinese-speaking world. (F)
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

CHIN 102  Beginning Chinese II  4 Credit Hours
Second course in the two-course elementary sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, and writing. (W)
Prerequisite(s): CHIN 101
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

Civic Engagement (CIVE)

CIVE 333  Service-Learning Practicum  1 Credit Hour
CIVE 333 is a one credit course that links an academic service-learning project to a relevant three or four credit course (not an independent study course) in which the student is or was recently enrolled. Students complete at least 30 hours of pre-approved, unpaid service hours. Students reflect upon their experience and its current and future impact through the writing of reflection papers, other brief writing assignments, and a final project. A student may repeat CIVE 333 up to three times with different linked courses.
Restriction(s):
Can enroll if College is Business or Engineering and Computer Science or Arts, Sciences, and Letters

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Communication (COMM)

COMM 220  Intro to Media & Culture  3 Credit Hours
Full Course Title: Introduction to Media and Culture. Course focuses on the role of media as cultural institutions that both maintain and challenge power structures. Includes critical analyses of media such as television, music, film, internet, and print publications, as well as emerging technologies. Course examines media as being shaped by but also shaping cultural, economic, legal, political and other aspects of society. Considers the role of media in a democracy, as crucial forums for the deliberation of pressing issues, and as key sites for the creation of meaning.
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280
COMM 260  Public Relations Principles  3 Credit Hours
Explores how public relations, as an area of communications management and production, can contribute to an organization's success. Provides a comprehensive introduction to the field of public relations, including: history and contemporary professional status of the public relations practitioner; role of public relations as a management discipline; major areas of public relations work, including media relations, public affairs, issues management, lobbying, organizational relations, development; techniques of public relations production - planning and presentation - with attention to the uses of specific tools available to practitioners, i.e., news releases, brochures, multimedia, Internet communications, special events. (YR).
Prerequisite(s): COMM 220

COMM 290  Communications Practicum  3 Credit Hours
COMM 290 (Practicum) provides introductory instruction and practice in a number of practical communications skills, with the field and focus changing each time the course is offered. (AY).
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMM 300  Communication Research Methods  3 Credit Hours
Gives detailed view of landmark research studies in the field. Acquaints students with logic of research inquiry, design and analysis, including questions of validity, reliability, causation, etc. Imparts basics of various research methods used in the communication field, such as survey interviews, depth interviews, focus groups, content analysis, and rhetorical analysis. Students design and conduct at least one study in communication, individually or in groups. (FW).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

COMM 306  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic, and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity, and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience.
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280
Restriction(s):
Can enroll if Level is Undergraduate

COMM 317  Case Studies in Tech Writing  3 Credit Hours
COMM 317 offers both practical and conceptual studies in technical writing and is open to non-technical as well as technical students. The course offers in-depth treatment of the communication problems and various document designs common to technical writing professionals. Instructional format includes lectures and discussions based on case material derived from actual events, followed up by preparation of written documents. Topics include document design, language barriers, and the role of the technical documents in product liability. (FWS).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

COMM 340  Professional Communication  3 Credit Hours
Course covers essential skills of professional written and oral communication within the organization; the purpose, process, and problems of professional communication; the influence of organizational structure; audience analysis; the writing and editing of reports (formal and informal, including memo reports) and of professional correspondence; the preparation of graphics; and the planning and delivery of oral presentations. May count toward Communications minor. (FW,S).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

COMM 360  Social Media for PR  3 Credit Hours
This course explores the emerging social media technologies and studies their application in contemporary PR practice. It examines the nature and role of social media in organizations and explores technologies including blogs, Microblogs, collaboration tools, podcasts, viral video, social bookmarking, mobile platforms, and other evolving technologies.
Prerequisite(s): COMM 260
Restriction(s):
Cannot enroll if Class is Freshman

COMM 364  Writing for Civic Literacy  3 Credit Hours
In Writing for Civic Literacy, students will study how politicians, the media and critical citizens use language to engage with the broader community. Students themselves will learn to use language to become more active, well-informed citizens. They will study rhetorical awareness, audience analysis and persuasive writing techniques and put those lessons to use in community settings. They will perform community service at agencies of their choosing and use those experiences as objects of analysis, researching the social context in which those agencies operate and writing analytically about the agencies. Further, students will synthesize classroom lessons and real-world experience by executing writing tasks for and with the agencies (these tasks might include editorials for the local press, informational webpages and fundraising materials).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMM 365  Health Communication  3 Credit Hours
Provides skills necessary for creating, interpreting, and critically evaluating messages about issues related to health and illness and encouraging active participation in healthcare. Examines theory and research regarding messages related to physical, mental, and social well-being from interpersonal, organizational, and mass communication approaches. (W, YR)
Restriction(s):
Can enroll if Class is Junior or Senior

COMM 366  Social Media for PR  3 Credit Hours
This gateway course provides the theoretical and methodological foundation to embark on the study of three key interrelated spheres of communication: Public and Organizational Culture, Public Advocacy and Democratic Culture, and Intercultural Communication and Global Culture. Students will have the opportunity to examine salient societal issues within each of the major areas, and explore connections between the different areas. Through a variety of class exercises and both individual and collaborative projects, the course will help students to acquire an analytical and practical "toolkit" enabling them to function effectively as communicators in culturally diverse organizations and civic contexts.
COMM 381  Postwar European Cinema   3 Credit Hours
The course will concentrate on a series of films from various European countries with a focus on the socio-political issues, historical events and cultural preoccupations that have defined and also challenged European societies from WWII to the present. Zeroing in on the construction of European identities, the course will analyze and compare modes of narrating national, class, racial, sexual and social differences in different European nations. Themes such as memories of war and the Holocaust, new conflicts, class, immigration, women’s rights, gender, and East-West relations will be addressed. The course will thus privilege a cinema that offers a “récit,” a story. Particular attention will be given to discourses on otherness and on the ways in which film culture has reflected, reinforced, reshaped and, in some instances, contested Europe’s past and current dominant ideologies, and identities. Readings by cultural historians and analysts will provide the context for an understanding of the films. The course will conclude with a discussion of the possible existence of a specific postwar European Cinema.

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

COMM 390  Topics in Communication   3 Credit Hours
A course in nonfiction narrative that focuses on memoir writing, emphasizing technique. Students will read book-length examples by Azar Nafiz, Nelson Mandela, Frank Conroy, Mar Karr, Susanna Kaysen, Frank McCourt, Ann Patchett and Joan Didion, examining these books as models for writing.

COMM 397  Communications Thesis   3 Credit Hours
A thesis project that is the culmination of the Communications major. Students will choose the project area and write a thesis (40-50 pages) under the direction of a Communications faculty member. The thesis option is available only to students with substantial practical experience in the communication field, and requires the approval of Communications faculty.

Restriction(s):
Can enroll if Class is Junior or Senior

COMM 398  Independent Studies-Comm   1 to 3 Credit Hours
Readings, supervised practice, or analytical assignments in Communications, determined in accordance with the needs and interests of those enrolled. May count toward Communications minor. (F,W).

COMM 420  Critical Media Studies   3 Credit Hours
Course presents various critical approaches to the study of the media. Perspectives include political economy, cultural studies, critical theory of the Frankfurt school and feminism. Through readings and first hand analysis of the media students will delve deeply into the institutional underpinnings, content, use and reception of media. There will be special emphasis on how broader economic, cultural and technological changes influence our experience of media in everyday life as creators, citizens, audiences and consumers.

Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

Restriction(s):
Can enroll if Class is Junior or Senior

COMM 422  Language and Popular Culture   3 Credit Hours
This course provides an overview of popular culture theories and communication models along with research methods. It offers an accessible, in-depth presentation of popular culture including music, film, television, magazines, comics, animation, and advertising in the US and the beyond. The main focus of the course is to highlight the functions of language, particularly, dialects, accents, and foreign languages, in producing and consuming local and global pop culture texts.

Restriction(s):
Can enroll if Level is Undergraduate

COMM 430  International Communications   3 Credit Hours
Course examines the relationship between globalization and communication from various vantage points such as cultural imperialism, global media flows, and hybridity theory. Students use these theoretical approaches to understand how people in particular locations experience, adapt, resist and modify globally circulating aspects of media, popular culture, news and information. Through critical responses to readings, class exercises, individual and team projects, students also explore how global pressures and changes influence the way people understand and project their identities, buy and sell communication as a commodity, negotiate borders, and create social change.

Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

Restriction(s):
Can enroll if Class is Junior or Senior

COMM 442  20th Century Public Argument   3 Credit Hours
This class is a survey of American public address in the 20th Century. Students will examine and critically analyze several of the most significant speeches and rhetorical movements of the last one hundred years. Through lectures, discussions, and analysis of speeches and other artifacts, we will focus on the relationship between rhetoric and history, and how theories of rhetorical action help us appreciate the role of discourse in the effective functioning of a democratic system. Students will learn to utilize several critical perspectives as a means of understanding both historical and contemporary political discourse. (W).

Prerequisite(s): SPEE 101

COMM 450  Principle of Organization Comm   3 Credit Hours
Course examines how communication networks function in organizations. Purpose: to provide an organizational context and conceptual framework for the practice of professional writing and speaking skills. Writing projects include a research report, a case study, and several shorter papers, practical and analytical, on assigned topics. Students cannot receive credit for both COMM 450 and COMM 550. (OC).

Prerequisite(s): COMM 340 or COMM 360 or COMM 440

Restriction(s):
Can enroll if Class is Junior or Senior
COMM 455  Gender and Media Studies  3 Credit Hours
The course will focus on several feminist approaches used in understanding the media and attempting to create social change through the media. The role of media in the definition and reproduction of gender-based hierarchies and in the renegotiation of gender boundaries will both be explored. To this end, both mainstream and women's media will be examined. The course will take a multicultural and international perspective, incorporating concerns of class, race, ethnicity, and nation as these intersect with the study of gender and media. Mainstream and alternative media will be analyzed through readings, films, case studies, in-class collaborative exercises and longer term projects. News, entertainment, and advertising genres will be examined in a variety of media such as the printed press, television, video, film, and the Internet. (W).
Prerequisite(s): WGST 275 or WGST 303 or ANTH 275 or PSYC 275 or SOC 275 or ANTH 303 or PSYC 303 or SOC 303 or HUM 275 or HUM 250 or WST 275
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

COMM 460  Public Relations Campaigns  3 Credit Hours
Focuses on strategies and tactics involved in planning and implementing a public relations campaign. Extends and refines skills acquired in earlier, prerequisite course work by incorporating management, production, and writing within a four-stage model for planning and action. This model provides a framework for role-playing, case study work, and projects done for evaluation by public relations professionals at local firms. The semester's portfolio of finished communications and "mock-ups" -- including planning materials, news releases, brochures, newsletters, Internet communications, video and audio scripts - should demonstrate command of entry-level, professional abilities as a public relations campaign manager and producer. (YR).
Prerequisite(s): COMM 260 and (COMM 360 or COMM 440)

COMM 462  Transnational Rhetorics  3 Credit Hours
Full Course Title: Transnational Rhetorics: Writers Across Borders
"Transnational Rhetorics" engages students in reading and writing stories that cross various forms or borders. These borders might be national, as in stories about immigration or displacement. Or, the borders might be more abstract, like the assumed borders between race, class, and gender, or even the possible barriers we perceive between personal experience and world events. In this course, we will read stories about people who reflect on these kinds of border-crossings. We will then take a rhetorical approach to these narratives and examine how they work, what similarities they share, and importantly, how they address their audiences. Then, we will then produce--in turn--our own border-crossing essays that attend to the same issues of audience, context, narrative, and creativity. (OC)
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMM 464  Contemporary Rhetorical Theory  3 Credit Hours
An examination of contemporary rhetorical theories through study of representative practitioners and related developments in linguistics, philosophy, psychology, communication, and composition and rhetoric. Students may not receive credit for both COMM 464 and COMM 564.
Prerequisite(s): COMM 201 or COMM 220 or COMM 290 or ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250
Restriction(s):
Cannot enroll if Class is Graduate

COMM 466  Arguing Feminism: Rhetoric  3 Credit Hours
An introduction to the work of major twentieth century feminists working in rhetoric and related fields. Students examine recurring themes of language, meaning, ethics and ideology, and practice writing strategies which address rhetorical and ethical concerns central to feminist/academic writing. (OC)
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Cannot enroll if Class is Freshman

COMM 477  Prof Communication Ethics  3 Credit Hours
An examination of professional communication ethics in the organizational context, focusing on important issues, problems, and concepts. This course is designed to help students become conscious of the role of values in a wide range of professional communication situations; to locate organizational behavior in an ethical framework based on considered definitions, standards, perspectives, and criteria for evaluation and analysis; to consider individuals as well as organizations as moral agents in a changing and complex universe; and to analyze topical cases on emergent issues in communication ethics. Some sample topics: ethics in decision-making and conflict-resolution; privacy and confidentiality; sexual harassment; whistleblowing; the "engineering" of consent; corporate image and ethos; issues in documentation, record-keeping, and technology; "issues management" and corporate responsibility; groupthink; obedience and personal responsibility; employee socialization. Students cannot receive credit for both COMM 477 and COMM 577. (OC).
Prerequisite(s): COMM 340 or COMM 360 or COMM 440 or COMM 450
Restriction(s):
Can enroll if Class is Junior or Senior

COMM 481  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reframes identities and locations and the political possibilities they create. (AY).
Prerequisite(s): HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Community Health Education (CHE)

CHE 101  Intro to Health Education  3 Credit Hours
This course is designed to introduce students to the field of community health education. Students will explore the theoretical and practical issues of health education and will identify and apply health education principles to health challenges facing individuals, groups and communities.

CHE 201  Medical Terminology  3 Credit Hours
This course will focus on an in-depth presentation of medical language to serve as a solid foundation for students interested in health care, medicine, nursing, pharmacy, physical therapy, or related careers. Medical terminology for both health and disease is presented in relation to human structure and function. Understanding of the course content builds a framework by introducing the key terms as they are applied to specific body systems.

CHE 402  Internship CHE  3 to 6 Credit Hours
CHE 402 Internship in Community Health Education is designed to provide opportunities for students to develop, enhance, and assess health education skills and competencies in the direct application of community health education. Students will observe an academically prepared health educator within a health service agency/organization and be directly involved in the delivery of health education and will reflect on learning experiences and discuss health education issues within the seminar sessions.

Prerequisite(s): CHE 101
Restriction(s):
Can enroll if College is Education, Health, and Human Services

* An asterisk denotes that a course may be taken concurrently.

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Comparative Literature (COML)

COML 221  Great Books I: Ancient World  3 Credit Hours
Introduction to masterpieces of Western world literature from the ancient world. Readings include the Bible, Iliad, Odyssey, Greek drama, and Roman authors. (YR).

COML 222  Great Books II  3 Credit Hours
Introduction to masterpieces of Western world literature from the Middle Ages and Renaissance. Readings include Dante, Chaucer, Wolfram, Cervantes, Shakespeare, Moliere, and Racine. (YR).

COML 223  Great Books III: Modern Era  3 Credit Hours
Introduction to masterpieces of Western world literature from the Modern Era. Readings include Swift, Voltaire, Rousseau, English romantic poets, fiction and drama of the 19th and 20th century. (YR).

COML 301  Literary Criticism  3 Credit Hours
This course introduces literary criticism and theory from Aristotle to the present, focusing on the changing concept of literature’s nature and function. Lectures, readings, and discussion cover such critics as Aristotle, Dryden, Pope, Johnson, Wordsworth, Coleridge, Arnold, T. E. Hulme, T. S. Eliot, and such movements as New Criticism, Phenomenology, Reader-Response, Archetypal Criticism, psychological approaches to literature, New Historicism, Marxism, Feminism, and Deconstruction. (OC).

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

COML 340  Modern European Short Fiction  3 Credit Hours
A careful reading of between 10 and 15 short novels (in English translation) with particular attention being paid to the manner in which their plots and characters express contemporary cultural issues. Such works as Dostoyevsky’s Notes from Underground, Conrad’s Heart of Darkness, and Unamuno’s Abel Sanchez will be included.

Prerequisite(s): (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

COML 341  Mod Eur Poetry in Translation  3 Credit Hours
Movements and genres of modern European poetry, from the Symbolists to the present. Included will be such poets as D’Annunzio, Cavafy, Rilke, Blok, Mayakovksy, Valery, Eluard, Pavese, Seferis, Akhmatova, Mandestram, Marinetti, Trakl, Mistrale, Vallejo, Morgenstern, Apollinaire, Loren, Transtromer, Brodsky, Milosz, and others in translation. (OC).

Prerequisite(s): ENGL 231

COML 344  Modern Literature: the Novel  3 Credit Hours
A careful examination of five or six significant modern novels in translation, with particular emphasis on their influence on the development of the novel, and their reflection of contemporary cultural issues. The works of such authors as Flaubert, Dostoyevsky, Tolstoy, Gide, Joyce, and Mann will be included.

COML 347  Clas Lit in Engl Translation  3 Credit Hours
A study of masterworks of ancient Greek and Roman literature with special attention to the development of epic, tragedy, comedy, and lyric poetry. Authors studied will include Homer, Virgil, Aeschylus, Sophocles, Euripides, Aristophanes, Terence, and Plautus.

Prerequisite(s): (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

Restriction(s):

COML 355  Urban Voices: France and Italy  3 Credit Hours
This course is an interdisciplinary approach to the concepts of urban development and literary, visual and cultural responses to the process of urbanization mainly in Rome and Paris. The readings will illustrate how the city shaped the writers’ creativity, as well as how their works interpret urbanization.

Restriction(s):

Can enroll if Class is Freshman

COML 375  The Hero in Literature  3 Credit Hours
Reflections on myth, history, and literature, based on analyses of literary texts. The individual hero may change from term to term. The course, for example, might center on the transition from Faust to anti-Faust. In this instance, some of the writers or works might include: The Faustbook, Marlow’s Doctor Faustus, Goethe’s Faust, Byron’s Manfred, a Faust opera, Thomas Mann’s Doktor Faustus, Gunter Grass’ The Tin Drum. All reading in English translation. (OC).
COML 390  Topics in Comparative Literature  3 Credit Hours
Examination of problems and issues in selected areas of comparative literature. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

COML 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in Comparative Literature in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor.

COML 404  Medieval Mystical Writers  3 Credit Hours
A study of the genre of mystical writing as it was developed and practiced throughout the Middle Ages and in 14th-century England particularly. Attention will be given to the historical, religious, and cultural contexts that enabled and were created by mystical texts. In addition, the course will explore how traditional and contemporary trends in the fields of religious and literary studies can be brought to bear on the genre of mystical writing. (OC)

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

COML 433  Writing Women in Renaissance  3 Credit Hours
This course will be taught in English, and will focus on the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Ariosto. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe, and Marguerite de Navarre. At last issue will be women's roles and women's images in city and court culture during the early modern period, and the interaction of their writings with the literary canons of Italy and France. (OC).

Restriction(s):
Can enroll if Level is Undergraduate

COML 455  This American Life  3 Credit Hours
The course "This American Life: Immigrant Literature and the American Dream" is a literary and cultural analysis of the literature of immigration. The readings are from works of fiction in a variety of genres, and are written by American and non-American prize-winning authors. Their common denominator is the pursuit of the American Dream and its many multifaceted aspects. The themes explored include: assimilation, acculturation, diversity, language, subculture, intertextuality, nostalgia, belonging, and double identity. Student wishing to take this course for graduate credit should sign up for COML 555. Students cannot receive credit for both COML 455 and COML 555.

Restriction(s):
Cannot enroll if Class is Freshman or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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Computer & Computational Math (CCM)

CCM 150  Computer Science I  4 Credit Hours
An introduction to structured computer programming covering problem formulation, algorithm development, the C++ programming language, program testing and debugging, capabilities and elements of computer organization, and object-oriented software methodologies.

Prerequisite(s): MATH 115*

Corequisite(s): CCM 150L

CCM 172  Computing Environ for Math  3 Credit Hours
This course covers introductory programming techniques for Mathematics majors. Students will learn to program in sage and python. Topics include data types, variables and assignments, decisions, loops, functions, recursion, arrays and objects. Programming assignments focus on problems that are mathematical in nature, giving students an opportunity to use simulations to understand and verify familiar mathematical results. This course, or CIS/CCM 150, satisfies the programming requirement for the Mathematics concentration.

Prerequisite(s): MATH 115

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

Can enroll if College is Arts, Sciences, and Letters

CCM 305  The Theory of Computation  3 Credit Hours
An introduction to the foundations of computer science including the theory of computability, Turing machines, automata, and formal languages.

Prerequisite(s): CIS 175 and (CIS 200 or IMSE 200)

CCM 315  Applied Combinatorics  3 Credit Hours
An introduction to methods and applications of enumerative and configural combinatorics. Students study several elegant and useful techniques for counting and/or generating the elements in large and unwieldy finite sets. Students also study topics in graph theory that are applicable to real world problems. Topics include basic counting principles, the principle of inclusion-exclusion, generating functions and recurrence relations. Topics from graph theory include graph models, paths, circuits, cycles, and connectedness; additional topics include the theory and applications of planarity, coloring, directed graphs, networks and network flows.

Prerequisite(s): (MATH 200 or MATH 300) and (MATH 217 or MATH 227)

CCM 372  Computing with Mathematica  3 Credit Hours
The course explores a variety of topics from different areas of undergraduate mathematics including calculus, matrix algebra, number theory, geometry, and discrete mathematics. Students learn to design customized Mathematica functions to solve specific problems in these areas using the symbolic, computational, graphics, and programming tools provided within Mathematica.

Prerequisite(s): MATH 217 or MATH 227

CCM 390  Topics in Computational Math  1 to 3 Credit Hours
A course designed to offer selected topics in different areas of applied mathematics. The specific topics will be announced together with the prerequisites for each separate offering. Course may be repeated when the topics covered differ.

CCM 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in Computers and Computational Mathematics in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor.
CCM 404  Dynamical Systems  3 Credit Hours
The aim of this course is to survey the standard types of differential equations. This includes systems of differential equations, and partial differential equations, including for each type, a discussion of the basic theory, examples of applications, and classical techniques of solutions with remarks about their numerical aspects. Also included are autonomous and periodic solutions, phase space, stability, perturbation techniques and Method of Liapunov. (AY).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)

CCM 451  Computer Graphics  3 Credit Hours
Basic geometrical concepts: graphics output primitives, two-dimensional transformations, windowing and clipping, three-dimensional viewing, visible surface detection methods, graphical user interfaces.
Prerequisite(s): (CCM 350 or CIS 350 or IMSE 350) or (ECE 370 and MATH 276) and (MATH 215 or MATH 205) and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

CCM 458  Introduction to Wavelets  3 Credit Hours
This course will introduce the students to theory and application of wavelets using linear algebra. Topics will include the discrete Fourier transform, the fast Fourier transform, linear transformations, orthogonal decomposition, discrete wavelet analysis, the filter bank, Haar Wavelet family, Daubechies’s Wavelet family, and applications. Students cannot receive credit for both MATH 458 and MATH 558. (OC)
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

CCM 472  Intro to Numerical Analysis  3 Credit Hours
Solution of linear systems by Gaussian elimination, solution of nonlinear equations by iterative methods, numerical solutions of ordinary differential equations, data fitting with spline functions, numerical integration, optimization. (F).
Prerequisite(s): MATH 217 or MATH 227

CCM 473  Matrix Computation  3 Credit Hours
A study of the most effective methods for finding the numerical solution of problems which can be expressed in terms of matrices, including simultaneous linear equations, orthogonal projections and least squares, eigenvalues and eigenvectors, positive definite matrices, and difference and differential equations. (AY).
Prerequisite(s): MATH 217 or MATH 227

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Computer & Information Science (CIS)

CIS 112  Computer Literacy/Info Mgmt  3 Credit Hours
This is a microcomputer literacy course with primary emphasis on the application tools of the word processor, spreadsheets, and database. Additional topics of computer terms, systems, and use in society are included. The course is intended for undergraduates in the College of Arts, Sciences, and Letters. No previous experience with computers is expected. (YR).

CIS 125  Survey of Computer Science  3 Credit Hours
A survey of computer science topics, including history of computing, office productivity software, the internet, HTML, JavaScript, web design, algorithms, assemblers and compilers, gates and logic design, models of computation, artificial intelligence and expert systems, computing ethics, privacy issues, intellectual property. No credit for CIS majors. (F,W,S).

CIS 150  Computer Science I  4 Credit Hours
This course provides a foundation for further studies in computer and information science and emphasizes a structured approach to problem solving and algorithm development. Topics include principles of program design, coding, debugging, testing, and documentation. Students are introduced to the Unified Modeling Language for requirements analysis using use-cases and activity diagrams, an object oriented programming language, and the fundamentals of computer hardware, system software, and components. The course will consist of three lecture hours and one two-hour laboratory.
Prerequisite(s): MATH 115* or MATH 113* or Mathematics Placement with a score of 116
Corequisite(s): CIS 150L

CIS 1501  CS I for Data Scientists  4 Credit Hours
This course provides a foundation for further studies in computer and information science and emphasizes a structured approach to problem solving and algorithm development using a high-level language more suited to data science applications. Topics include principles of program design, coding, debugging, testing, and documentation. Students are introduced to the Unified Modeling Language for requirements analysis using use-cases and activity diagrams, an object-oriented programming language for data science applications, and the fundamentals of computer hardware, system software, and components. The course will consist of three lecture hours and one two-hour laboratory. The labs will cover various data science applications. (F,W,S)
Prerequisite(s): MATH 115* or MATH 113* or Mathematics Placement with a score of 116

CIS 200  Computer Science II  4 Credit Hours
This course presents techniques for the design, writing, and debugging of medium-sized programs, and an introduction to data structures (stacks, queues, linked lists) using an object-oriented programming language. Topics covered include pointers, templates, and inheritance. The principles of UML modeling are continued. This course will consist of three lecture hours and one two-hour laboratory.
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of 116) and (CIS 150 or IMSE 150 or CCM 150)
Corequisite(s): CIS 200L

CIS 2001  CS II for Data Scientists  4 Credit Hours
This course presents techniques for the design, writing, and debugging of medium-sized programs, and an introduction to data structures (stacks, queues, linked lists) using an object-oriented programming language for data science applications. Topics covered include pointers, templates, and inheritance. The principles of UML modeling are continued. This course will consist of three lecture hours and one two-hour laboratory. The labs will cover various data science applications. (F, W, S)
Prerequisite(s): CIS 1501 and MATH 115 or MATH 113 or Mathematics Placement with a score of 116
CIS 205  Comp Programming for Engineers   3 Credit Hours
Full Course Title: Computer Programming for Engineers-Intermediate
topics in computer programming: arrays, files, structured data types,
pointers, functions. Overview of digital computer hardware and system
software components: machine architecture, operating systems,
computer networks, data security, and performance evaluation. No credit
for CIS majors.
Prerequisite(s): ENGR 100 or (MATH 105 or Mathematics Placement with
a score of 113)

CIS 275  Discrete Structures I   4 Credit Hours
This course introduces students to various topics in discrete
mathematics, such as set theory, mathematical logic, trees, and graph
theory. Applications to relational databases, modeling reactive systems
and program verification are also discussed. (F,W,S)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of
116) and CIS 200*

CIS 285  Software Engineering Tools   3 Credit Hours
This course will cover various CASE tools, such as UML modeling
and code generation tools, configuration management tools, defect
management tools, an integrated development environment for coding
and debugging, unit and testing tools, and build tools. Students will learn
these tools in a laboratory environment. This course will be comprised of
one lecture hour and one two-hour laboratory. (F,W)
Prerequisite(s): CIS 200*

CIS 290  Topic in Programming Languages   2 Credit Hours
One significant programming language is covered in depth. The particular
language changes from term to term. The language chosen might be Ada,
C, MODULA 2, USP, PROLOG, or SMALLTALK.
Prerequisite(s): CIS 200

CIS 294  Programming with Visual Basic   3 Credit Hours
An introduction to create professional-looking applications using the
graphical user interface of Windows. Students learn how to create
graphical objects and controls, write event driven code that responds to
clicking on buttons, work with multiple forms and executable files. (F,S)
Prerequisite(s): CIS 200 or IMSE 200

CIS 296  Java Programming   3 Credit Hours
Course covers Java Programming language, focusing on GUI
development, distributed computing and network applications.
Prerequisite(s): CIS 200 or CIS 2001

CIS 297  Intro to C Sharp   3 Credit Hours
This course provides an introduction to the C# programming language
and the .NET Framework for the development of Windows game
applications. Some discussion of DirectX programming and Xbox game
development is also included. (W)
Prerequisite(s): CIS 200 or CIS 2001

CIS 298  Intro to Python   3 Credit Hours
Full Title: Introduction to Python An introduction to the Python
programming language and its various libraries, packages, and toolkits.
The focus of this course will be on the development of analytics/data
science applications. (W)
Prerequisite(s): CIS 200 or IMSE 200
Restriction(s):
Can enroll if Level is Undergraduate

CIS 299  Internship   1 Credit Hour
Student works with an industrial sponsor in the area of CIS. Approval of
Internship Coordinator required. (F,W,S).

CIS 306  Discrete Structures II   4 Credit Hours
This course introduces students to further topics in discrete
mathematics, including theory of computation, more complexity theory,
coding theory, and game theory.
Prerequisite(s): CIS 275

CIS 310  Computer Org and Assembly Lang   4 Credit Hours
The architecture of computer systems and associated software. Topics
include digital logic circuits, computer interfacing, interrupt systems,
input/output systems, memory systems, assemblers and assembly
language programming, and computer networks. (F,W,S)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of
116) and (CIS 200 or IMSE 200) and CIS 275

CIS 316  Pract. Comp. Sec.   3 Credit Hours
Full Title: Practical Aspects of Computer Security This course provides a
practical introduction to a broad range of security topics including legal,
ethical and professional issues in information security. Covered topics
include: practical computer security principles; firewalls, malware, and
intrusion detection; cryptography basics and its applications; mobile
devices and related security issues; network technologies and their
vulnerabilities. (YR)
Prerequisite(s): CIS 200
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 3200  Data Science II   4 Credit Hours
This course provides an overview of what Big Data is and explores its
characteristics. It introduces the fundamental technologies, platforms,
and methods that enable Big Data analysis, and covers how to acquire,
store, and analyze very large amounts of information to complete Big
Data analysis tasks. Topics include MapReduce, similarity search, mining
real-time data streams, link analysis, clustering, recommender systems,
social network graph mining, and large scale data mining tasks. (W)
Prerequisite(s): (CIS 2001 or CIS 200) and ECE 3100

CIS 350  Data Struc & Alg Anlys for SE   4 Credit Hours
This course focuses on data design and algorithm design. Data design
topics include object-oriented discussions of hashing, advanced tree
structures, graphs, and sets. Algorithm design topics include the greedy,
divide-and-conquer, dynamic programming, backtracking and branch-
and-bound techniques. A significant discussion of algorithm complexity
theory, including time and space trade-offs and elementary computability
theory, is included. (F,W,S)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of
116) and (CIS 200 or IMSE 200) and CIS 275

CIS 3501  Data Struc and Algorithm Anlys   4 Credit Hours
This course focuses on data design and algorithm design. Data design
topics include object-oriented discussions of hashing, advanced tree
structures, graphs, and sets. Algorithm design topics include the greedy,
divide-and-conquer, dynamic programming, backtracking and branch-
and-bound techniques. A significant discussion of algorithm complexity
theory, including time and space trade-offs and elementary computability
theory, is included. (F,W,S)
Prerequisite(s): (CIS 2001 or CIS 200) and ECE 3100

CIS 351  Data Science II   4 Credit Hours
This course focuses on data design and algorithm design for software
engineers. Data design topics include object-oriented discussions of
hashing, advanced tree structures, graphs and sets. Algorithm design
topics include the greedy, divide-and-conquer, dynamic programming,
backtracking and branch-and-bound techniques. A significant discussion
of algorithm complexity theory, including time and space trade-offs and
elementary computability theory, is included. (F,W,S)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of
116) and (CIS 200 or IMSE 200) and CIS 275

CIS 3501  Data Struc & Alg Anlys for SE   4 Credit Hours
This course focuses on data design and algorithm design. Data design
topics include object-oriented discussions of hashing, advanced tree
structures, graphs, and sets. Algorithm design topics include the greedy,
divide-and-conquer, dynamic programming, backtracking and branch-
and-bound techniques. A significant discussion of algorithm complexity
theory, including time and space trade-offs and elementary computability
theory, is included. (F,W,S)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of
116) and (CIS 200 or IMSE 200) and CIS 275
CIS 375  Software Engineering I  4 Credit Hours
This course presents an in-depth treatment of the following software engineering topics: software engineering paradigms, requirements, specification, functional design, object-oriented design, user interface design, software verification and validation, and the maintenance and management of software engineering artifacts, as well as an introductory discussion of software reliability. Various phases of the software engineering process will be modeled using UML. (FW)
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40)

CIS 376  Software Engineering II  4 Credit Hours
This course continues the formal development of the software engineering material begun in CIS 375. Topics covered include personal software process, team software process, formal methods, security, software architecture, software quality assurance, software fault tolerance, the evaluation of the effectiveness of human computer interaction and software reliability. (W,S)
Prerequisite(s): CIS 375

CIS 381  Industrial Robots  4 Credit Hours
The course introduces students in engineering and computer science to fundamentals of robotics technology, programming and their applications in industrial environment. The emphasis will be on robotics anatomy and configurations, robotocs kinematics, end effectors, use of sensors in robotics, robotics programming, design of robot workcell, robotics applications to production problems, cost justifications and robotics safety, rather than on the extensive theory of robotics. Three-hour lecture and three-hour laboratory per week.
Prerequisite(s): MATH 115
Restriction(s):
Can enroll if Class is Junior or Senior

CIS 387  Digital Forensics I  4 Credit Hours
This course takes a detailed, hands-on approach to study the procedures and techniques used to identify, extract, validate, document and preserve electronic evidence. Students completing this course will be familiar with the core computer science theory and practical skills necessary to perform basic computer forensic investigations, understand the role of technology in investigating computer-based crime, and be prepared to deal with investigative bodies at a basic level.
Prerequisite(s): (CIS 200 or ECE 270) and (CIS 310* or ECE 370* or ECE 372*)
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

CIS 390  Topics in Computer Science  1 to 3 Credit Hours
A course designed to offer selected topics in an area of computer science. The specific topics will be announced (together with special prerequisites) each time offered. Students must elect different topics to take both CIS 390 and CIS 391. (OC).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and ECE 276) or (ECE 370 and MATH 276)

CIS 391  Topics in Computer Science II  1 to 3 Credit Hours
A course designed to offer selected topics in an area of computer science. The specific topics will be announced (together with special prerequisites) each time offered. Students must elect different topics to take both CIS 390 and CIS 391. (OC).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and ECE 276) or (ECE 370 and MATH 276)

CIS 399  Internship  1 Credit Hour
Student works with industrial sponsor in the area of CIS. Permission of Internship Coordinator required. (FW,S)

CIS 400  Programming Languages  4 Credit Hours
Systematic study of programming languages with regard to their implementation, structures, and use. Languages are compared with regard to their various data types, data structures, operations, control structures, programming environments, and ease of use in solving various programming problems. (FW)
Prerequisite(s): (CIS 350 or IMSE 350 or CIS 3501) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276)

CIS 405  Algorithm Analysis & Design  3 Credit Hours
This course investigates how to design efficient algorithms. Topics include asymptotic analysis, amortized analysis, divide-and-conquer, dynamic programming, greedy algorithms, branch and bound, backtracking, lower bounds, NP-completeness and approximation algorithms.
Prerequisite(s): CIS 350

CIS 411  Natural Language Processing  3 Credit Hours
This course provides an introduction to the theory and practice of natural language processing (NLP), as well as the approaches that allow understanding, generating, and analyzing natural language. The course will cover the three major areas in NLP: syntax, semantics, and pragmatics. The course will introduce both knowledge-based and statistical approaches to NLP, illustrate the use of NLP techniques and tools in a variety of application areas, and provide insight into many open research problems. (YR)
Prerequisite(s): CIS 350 or CIS 3501

CIS 421  Database Mgmt Systems  4 Credit Hours
An introduction to database systems, concepts, and techniques. Topics covered include: database environments, ER modeling, relational data model, object-oriented databases, database design theory and methodology, database languages, query processing and optimization, concurrency control, database recovery, and database security.
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 351 or (ECE 370 and MATH 276)

CIS 422  Massive Data Management  4 Credit Hours
An introduction to database systems, concepts, and techniques for big data. The course discusses classical relational technologies, and then covers the more current approaches to managing massive amounts of data for analytics purposes. Topics include database environments, database design, the relational data model, normalization, SQL, query processing, parallel databases and query processing, in-database analytics, data warehousing, key-value and column stores, NoSQL and NewSQL approaches for managing massive data. (F)
Prerequisite(s): (CIS 2001 or CIS 200) and CIS 3200

CIS 423  Dec Support and Exp Systems  3 Credit Hours
The application of artificial intelligence to building decision support and expert systems for management and other applications. Topics include fundamentals of artificial intelligence, knowledge representation and knowledge processing, tools for building expert systems (logic programming, expert shells), decision support system design (modeling and simulation), expert system design (knowledge engineering, learning). (F)
Prerequisite(s): CIS 421
CIS 425 Information Systems 4 Credit Hours
This course provides in-depth coverage of advanced infrastructures for the development of next-generation information systems. Topics include information systems, data integration, XML, web services, ontologies, workflow, data warehousing, and data mining.
Prerequisite(s): CIS 375 and (CIS 421* or CIS 422*)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

CIS 427 Comp Networks and Dis Process 4 Credit Hours
Study of the management aspects of computing networks and distributed systems. Topics include network architectures (ISO/OSI, TCP/IP, ATM), communication hardware (transmission media, network adaptors, switches), encoding, framing, error detection and correction, reliable transmission, data link control and LAN technology, internetworking, routing/congestion control, network design/management.
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 351) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317

CIS 435 Web Technology 3 Credit Hours
This course deals with the study of technologies used to design and implement multimedia web sites. Topics include web servers, HTML, CGI, scripting languages, Java applets, back-end database connectivity, web security, multimedia, XML. (FW).
Prerequisite(s): CIS 375* or CIS 553*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Cannot enroll if Major is

CIS 436 Mobile App Des & Impl 3 Credit Hours
This course introduces students to the development of software applications for programmable mobile and wireless intelligent handheld devices. Topics covered include the different mobile development platforms, best practices in mobile user interaction design, software quality assurance in mobile environment, security and privacy issues, and context-aware computing. Students will participate in a final project.
Prerequisite(s): CIS 375*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

CIS 437 Advanced Networking 3 Credit Hours
Topics include an overview of the internet, congestion control, quality of service, internet multicasting, multimedia networking, mobile and wireless networks, vehicular networks, overlay networks, peer-to-peer networks, internet management (SNMP), and internet applications (web-HTTP and email-SMTP).
Prerequisite(s): CIS 427
Restriction(s):
Cannot enroll if College is Business

CIS 446 Wireless & Mobi Comp Sec 3 Credit Hours
Full course title: Wireless and Mobile Computing Security. The course focuses on security and privacy issues in the area of wireless networks and mobile computing such as cellular networks, wireless LANs, connected vehicles, smart and mobile devices, sensors and sensor networks, IoT, etc. The course will first present on overview of wireless communication and wireless systems, then focus on attacks, discuss proposed solutions and their limitations. Topics of this course include: (1) introduction to security primitives and wireless networks; (2) security issues in single-hop wireless networks that include cellular networks, RFID, modern vehicle, smartphone security; (3) security issues in multi-hop wireless network that include Mobile Ad Hoc network, wireless sensor network and vehicular network security. (YR)
Prerequisite(s): (CIS 200 or CIS 2001) and MATH 396

CIS 447 Intro Computr & Ntwrk Security 3 Credit Hours
This course will provide a broad-spectrum introduction to the fundamental principles of computer and network security. Topic will include security policies, models and mechanisms for confidentiality, integrity and availability, access control, authorization, cryptography and applications, threats and vulnerabilities in computer networks, key management, firewalls and security services in computer networks.
Prerequisite(s): CIS 450*
Restriction(s):
Cannot enroll if College is Education, Health, and Human Services or Business

CIS 449 Intro to Software Security 3 Credit Hours
This course provides a broad-spectrum introduction to the fundamental principles of software security, as well as the approaches that allow understanding common software practices, analyzing programs for vulnerabilities, and methods for developing secure software systems. The course will cover three major areas: software attacks and defenses, program analysis, and software verification. Various forms of software will be considered in this class including high level applications and system software. The course will also provide insight into many open research problems in this area. (YR)
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and ECE 276) or (ECE 370 and MATH 276)

CIS 450 Operating Systems 3 or 4 Credit Hours
Introduction to computer operating systems. Process control, threads, concurrency, memory management, virtual memory, uniprocessor, multiprocessor, and real-time scheduling, I/O management, disk scheduling, file management, distributed processing, client/server, clusters, distributed process management,security. (FW).
Prerequisite(s): CIS 310 and (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317*

CIS 451 Computer Graphics 3 Credit Hours
Basic geometrical concepts: graphics output primitives, two-dimensional transformations, windowing and clipping, three-dimensional viewing, visible surface detection methods, and graphical user interfaces. (F).
Prerequisite(s): (MATH 217 or MATH 227 or MATH 228) and (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276)
CIS 452 Inf Vis & Multimedia Gaming 3 Credit Hours
This course introduces basic techniques for digital animation, computer and video games, and web multimedia. Topics include the process of creating animated video clips from start to finish, including story creation, storyboarding, modeling, animation, and post-production; several key techniques for video editing and motion generation, including keyframe, motion capture editing, collision detection, particle systems, physical simulation, and real-time rendering; techniques for web animation and multimedia; and internet gaming.
Prerequisite(s):
CIS 451 or CIS 487
Restriction(s):
Can enroll if Class is Senior
Cannot enroll if College is Education, Health, and Human Services or Business

CIS 467 Digital Forensics II 4 Credit Hours
This course is a continuation of Digital Forensics I and will focus on Internet Forensics. Students will examine in-depth concepts in Internet evidence collection and preservation, as well as applications of contemporary commercial forensic investigative software.
Prerequisite(s):
(CIS 427* or ECE 471*) and (CIS 387 or ECE 387)
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if College is Business

CIS 474 Compiler Design 3 Credit Hours
Principles of language compilation. Introduction to formal languages. Lexical analysis, top-down and bottom-up parsing, code generation and optimization. Error handling and symbol table management. Run-time storage management. Programming language design. Introduction to compiler-writing tools such as LEX and YACC. (FW).
Prerequisite(s):
CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276)

CIS 476 Soft Arch & Design Patterns 3 Credit Hours
This course focuses on design patterns in object-oriented programming. This course begins with an overview of UML and a review of object-oriented programming and then moves on to various structural, behavioral and creational patterns, including: facades, adaptors, bridges, factories and the template method. Analysis of case studies will also be discussed. Using various modern software tools, students will apply various design patterns to real-world software design problems to gain complete practical understanding. (FW)
Prerequisite(s):
CIS 375
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 479 Intro to Artificial Intel 3 Credit Hours
This course introduces students to basic concepts and methods of artificial intelligence from a computer science perspective. Emphasis of the course will be on the selection of data representations and algorithms useful in the design and implementation of intelligent systems. The course will contain an overview of one AI language and some discussion of important applications of artificial intelligence methodology. (S)
Prerequisite(s):
CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276) or (ECE 370 and ECE 276)

CIS 481 Computational Learning 3 Credit Hours
This course covers basic computational aspects of learning to perform a task and improve with experience. Topics include learning frameworks and problem formulations; standard models, methods, computational tools, algorithms and modern techniques; and methodologies to evaluate learning ability and to automatically select optimal models. The main focus is on computer science (e.g., basic runtime, space and complexity analysis, programming, and empirical evaluations?). Simple applications to areas such as computer vision, natural language processing (NLP), and robotics will also motivate the course material. (W)
Prerequisite(s):
CIS 306 and (MATH 217* or MATH 227*) and (IMSE 317* or BENG 364* or MATH 425*)
Restriction(s):
Cannot enroll if Class is Graduate or Doctorate

CIS 4851 Data Security and Privacy 3 Credit Hours
This course covers basics of data security and privacy techniques, which can facilitate the use of data in a secure and privacy-sensitive way. Topics include security and privacy challenges due to data collection and analytics, technologies and strategies for data security and privacy (access control mechanism, integrity policy, cryptography and encryption, notice and consent, anonymization or de-identification, deletion and non-retention). (W)
Prerequisite(s):
CIS 200 or CIS 2001

CIS 487 Computer Game Design & Implem 3 Credit Hours
This course deals with the study of the technology, science and art in the creation of computer games. The focus of the course will be hands-on development of computer games. Students will study a variety of software technologies relevant to computer game design, including programming languages, scripting languages, operating systems, file systems, networks, simulation engines and multi-media design systems. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, real-time processing, game theory, software engineering, human computer interaction, graphic design and game aesthetics. (F).
Prerequisite(s):
CIS 375*
Restriction(s):
Can enroll if Class is Junior or Senior
Cannot enroll if Major is

CIS 488 Computer Game Design II 3 Credit Hours
This course is a continuation of the material studied in CIS 487. The focus of the course will be hands-on development of computer game development tools (e.g. game engines). Students will study a variety of software technologies relevant to computer game design, including: 3D graphics, computer animation, data-driven game design, multiplayer game programming, and game AI. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, game theory, software engineering, human computer interaction and game content development. (W)
Prerequisite(s):
CIS 487
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

CIS 490 Advanced Topics 1 to 3 Credit Hours
This course is intended for seniors and graduate-level students in CIS. For specific topic, consult current semester’s Schedule of Classes. (OC).
Prerequisite(s):
CIS 350 or CIS 3501 or IMSE 350 or (ECE 270 and ECE 276) or (ECE 370 and ECE 276)
CIS 491  Research Project I  1 to 4 Credit Hours
Provides the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the semester when such a course is to be elected, an interested student must submit to the CIS chair and one CIS faculty member a written request for permission to elect a research course on the appropriate form available in the CIS Office. The request will include a description of the proposed research project. The CIS chair will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Grades will be granted on a Pass/Fail (S/E) basis exclusively. (F,W,S).
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is CIS/Information Systems

CIS 492  Research Project II  1 to 4 Credit Hours
This course is a second registration for a research project in CIS. (F,W,S).
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is CIS/Information Systems

CIS 493  Independent Study I  1 to 4 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and an instructor, which shall not duplicate a formal course offering. Permission of instructor required. (F,W,S).

CIS 494  Independent Study II  1 to 4 Credit Hours
This course is a second registration for an independent study in CIS. Permission of instructor required. (F,W,S).

CIS 4951  Design Seminar I  2 Credit Hours
Students participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice. (F,W,S)
Prerequisite(s): CIS 375 and CIS 310 and (CIS 427 or CIS 450)
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 4952  Design Seminar II  2 Credit Hours
Students continue to participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice. (F,W,S)
Prerequisite(s): CIS 4951
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 4961  Design Seminar for SE I  2 Credit Hours
Software engineering students participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice in software engineering. (F,W,S)
Prerequisite(s): CIS 376
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Engineering and Computer Science

CIS 4962  Design Seminar for SE II  2 Credit Hours
Software engineering students continue to participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice in software engineering.
Prerequisite(s): CIS 4961 and CIS 476*
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 4971  Cap Sem for Data Sci I  2 Credit Hours
Data science students participate in the design and implementation of a major data science project. Seminar topics discussed include: computing ethics and professional practice in data science. (F,W,S)
Prerequisite(s): CIS 3200 and (STAT 325 or IMSE 317)
Restriction(s):
Can enroll if Class is Senior

CIS 4972  Cap Proj for Data Sci II  2 Credit Hours
Data science students continue to participate in the design and implementation of a major data science project. Seminar topics discussed include: computing ethics and professional practice in data science. (F,W,S)
Prerequisite(s): CIS 4971 and STAT 430*
Restriction(s):
Can enroll if Class is Senior

CIS 4981  Design Seminar for CIS-DS I  2 Credit Hours
Full Course Title: Design Seminar for Dual Degree CIS-DS Majors I Dual degree CIS and Data Science students participate in the design and implementation of a major software project involving data science. Seminar topics discussed include computing ethics and professional practice in data science. (F,W,S)
Prerequisite(s): CIS 375 and CIS 3200 and (STAT 325 or IMSE 317) and CIS 310 and (CIS 427 or CIS 450)
Restriction(s):
Can enroll if Class is Senior

CIS 4982  Design Seminar for CIS-DS II  2 Credit Hours
Dual Degree CIS and Data Science students participate in the design and implementation of a major software project involving data science. Seminar topics discussed include computing ethics and professional practice in data science. (F,W,S)
Prerequisite(s): CIS 4981 and STAT 430*
Restriction(s):
Can enroll if Class is Senior

CIS 499  Internship  1 Credit Hour
Student works with industrial sponsor in area of CIS. Approval of Internship Coordinator required. (F,W,S).

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Criminal Justice Studies (CRJ)

CRJ 200  Intro to Criminal Justice  3 Credit Hours
This course provides an introduction to issues of crime and neighborhood disorder as well as society's responses to these problems. We will examine the nature and causes of crime, criminal law, constitutional safeguards, and the organization and operation of the criminal justice system including the police, courts, and corrections. The history of the criminal justice system, terminology and career opportunities will also be discussed.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>CRJ 300</td>
<td>Political Analysis</td>
<td>3</td>
<td>Introduction to research design, data collection and analysis, sampling, and statistics for social scientists. Should be elected as soon as possible after the declaration of major. POL 101 or equivalent recommended. (F, W).</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 302</td>
<td>Theory of the Law</td>
<td>3</td>
<td>A comprehensive introduction to the theoretical foundations and the functional politics of law, with special emphasis on the different moral justifications of law; the relation between law and justice; the relation between law and freedom; due process and fairness in any legal system. This course is designed to have special relevance for those considering law as a career. POL 101 or equivalent recommended. (OC).</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 307</td>
<td>Forensic Anthropology</td>
<td>3</td>
<td>Forensic anthropology has recently seen a lot of exposure through popular television shows like CSI and Bones. Have you ever wondered how much of what you were seeing was real? Do the dead really &quot;talk&quot; about their lives and how they died? This course is designed as an introductory course for students interested in demystifying and getting to know the real forensic anthropology. Forensic anthropology is a specialized sub-field of biological anthropology that applies many of the methods of biological anthropology to the discovery, excavation, and identification of human remains in a medico-legal context. In this class we learn about the human skeleton and the techniques used in the identification of individuals, such as age-at-death estimation, sex determination, stature, ancestry, and personal identification. We also deal with the assessment of the different types of trauma, and whether or not we can tell the cause and manner of death. The broader ethical roles and responsibilities of forensic anthropologists are also discussed, including discussions of how we determine race/ancestry, as well as ethical responsibilities we have during the investigation of human rights abuses, disasters and criminal inquiries. (F)</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Cannot enroll if Class is Freshman</td>
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<tr>
<td>CRJ 308</td>
<td>Moral and Political Dilemmas</td>
<td>3</td>
<td>This course focuses on the tensions and relations between personal morality and political action by examining the moral aspect of contemporary policy issues such as the right to life, environmental policy, and discrimination. POL 101 or equivalent recommended. (YR).</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Class is Junior or Senior Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 309</td>
<td>Introduction to Law &amp; Society</td>
<td>3</td>
<td>Law and Society is a field of study that examines the interaction between the legal system and society from the perspective of the social sciences and humanities. This course focuses on core components of the legal system including courts, lawmaking bodies, regulatory administration, alternative dispute resolution systems, and the legal profession. Throughout the course, students develop the ability to examine the legal system and its relationship to equality, social change, and public benefits using social science evidence. (YR)</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Cannot enroll if Class is Freshman</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 322</td>
<td>Psychology of Prejudice</td>
<td>3</td>
<td>A consideration of ethnic (including racial, sexual, and religious) prejudice from the psychological point of view, focusing on the mind of both the oppressor and the oppressed. (AY).</td>
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<td><strong>Prerequisite(s):</strong></td>
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<td>PSYC 170 or PSYC 171 or PSYC 101</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 323</td>
<td>Urban Politics</td>
<td>3</td>
<td>A survey of the political process in urban areas, giving special attention to the changing roles of cities in American politics. POL 100 or equivalent recommended. (YR).</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 324</td>
<td>Serial and Mass Homicide</td>
<td>3</td>
<td>The phenomenon of multiple homicide, especially mass shootings and serial murder, is of special interest in the field of criminology. Perpetrators of such acts and their methodologies can be studied for the purpose of primary and secondary prevention. (FW)</td>
</tr>
<tr>
<td>CRJ 325</td>
<td>Psy of Interpersonal Relation</td>
<td>3</td>
<td>This course presents an overview of theory and research conducted by social psychologists that has been aimed at understanding interactions between individuals. Topics include an exploration of the research process that is used to investigate interpersonal relationships, the processes underlying social perception, friendship, liking, love, close relationships, aggression and violence in interpersonal relationships. (YR).</td>
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<td><strong>Prerequisite(s):</strong></td>
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<td>PSYC 170 or PSYC 171 or PSYC 101</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 335</td>
<td>Philosophy of Law</td>
<td>3</td>
<td>An examination of some of the important philosophical issues relevant to law and legal theory, including legal punishment, legal responsibility, and the relationship between law and morality. Both classical and contemporary writings will be studied. Prerequisite: a previous philosophy course or permission of instructor. (AY).</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 350</td>
<td>Poverty and Inequality</td>
<td>3</td>
<td>In a middle class-oriented culture, the poor experience many problems and are also considered deviant, which tend to make poverty self-perpetuating. This stratum will be explored with respect to life styles, life changes, contributing factors, characterics, individual and social consequences, and evaluation of attempted solutions. (YR).</td>
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<td><strong>Prerequisite(s):</strong></td>
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<td>SOC 200 or SOC 201</td>
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<td><strong>Restriction(s):</strong></td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 362</td>
<td>Women, Politics, and the Law</td>
<td>3</td>
<td>An examination of the political behavior of women in American politics. Included is an analysis of the legal and legislative demands of American women. (AY).</td>
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<td><strong>Restriction(s):</strong></td>
<td></td>
<td>Can enroll if Level is Undergraduate Can enroll if College is Arts, Sciences, and Letters</td>
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</table>
CRJ 363 Crim Justice Syst and Policy  3 Credit Hours
The structure and processes of criminal justice administration in America, including analysis of current issues in police behavior, courts, and corrections. POL 101 or equivalent recommended. (F, S, W).
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 369 US Civil Rights Movement  3 Credit Hours
A survey of race relations and civil rights activity from the late 19th century to the present. The principal focus, however, is on the period since World War II, especially on the mass-based Southern civil rights movement (1955-1965) and the various policy debates and initiatives of the past thirty years, most notably affirmative action and busing. We also examine critiques of non-violence and integrationism. (AY).
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 382 Social Psychology  3 Credit Hours
An introductory study of interrelationships of the functioning of social systems and the behavior and attitudes of individuals. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 390 Topics in Criminal Justice  3 Credit Hours
Examination of problems and issues in selected areas of criminal justice. Title as listed in the Schedule of Classes will change according to content. Course may be repeated when specific topics differ. (OC)

CRJ 403 Minority Groups  3 Credit Hours
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. (F, W).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 407 Psychology of Adolescence  3 Credit Hours
Considers adolescence as an interaction of rapid biological and social change. Examines the theoretical and empirical literature in some detail. Prerequisite or permission of instructor. (F, W).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 408 Police and the Community  3 Credit Hours
This course examines the diverse roles of the public police and how to achieve effective community policing. After reviewing the evolution of community policing, this course focuses on understanding police mission and culture, involving the community, proactive policing, implementing community policing, communicating with a diverse population, the challenge of gangs, forming partnerships with the media, and building partnerships in the community. (F, W)
Prerequisite(s): CRJ 200

CRJ 409 Intel and Homeland Security  3 Credit Hours
Full Title: Intelligence and Homeland Security This course will provide an in-depth examination of the principles that guide the collection, analysis, and sharing of intelligence in the United States and how these principles impact homeland security. Topics will include the US Intelligence community (CIA, FBI, military intelligence), the National Criminal Intelligence Sharing plan, the National Intelligence Strategy, and the recent emphasis placed on Intelligence-Led Policing. Emphasis will also be placed on the increased role that local and state law enforcement agencies as well as private sector entities play in contributing to the assessment of threats to homeland security. (F; W)
Prerequisite(s): CRJ 200

CRJ 410 Quantitative Research & Stats  4 Credit Hours
An introduction to methods of data collection and analysis. Also discussion of research design and the philosophy of social science. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 412 Men and Masculinities  3 Credit Hours
This course addresses the question, "What is a man?" in various historical, cross-cultural, and contemporary contexts. A major focus on the social and cultural factors that underlie the shape and conceptions of manhood and masculinity in America as well as in a variety of societies around the globe. (AY)
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

CRJ 413 American Constitutional Law  3 Credit Hours
A major theme of this course is the development of the constitution, especially focusing on the themes of judicial review, judicial self-restraint and judicial activism; the expansion of executive and legislative powers; and the rise of "substantive due process of law." POL 101 or equivalent recommended. (AY).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 4130 Qualitative Research Methods  3 Credit Hours
Qualitative research methods involve the observation and study of people in their everyday lives, in their taken-for-granted worlds. Qualitative research seeks to combine close empirical observation with analytic techniques that demand (and teach) personal and social self-consciousness as necessary to an understanding of the social world of "others". This course in qualitative methods is designed to acquaint students with field research theories and techniques. Students will gain hands-on experience in participant observation, interviewing, and the use of sociological scholarship. Qualitative Research Methods will prepare students to gather data, focus the data in a social scientific manner, analyze the data, and then organize it in reportable form. (F, W).
Prerequisite(s): SOC 308
CRJ 414  Civil Rights and Liberties  3 Credit Hours
An analysis of the Bill of Rights and the 14th Amendment, with particular
emphasis upon recent landmark or controversial Supreme Court
decisions dealing with freedom of speech and religion, rights of criminal
defendants; cruel and unusual punishment, right to privacy; civil rights
and equal protection clause; and apportionment. POL 101 or equivalent
recommended. (YR).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Program is

CRJ 415  Restorative Justice  3 Credit Hours
This course explores the practice of restorative justice as it has been
engaged in historical and contemporary criminal justice contexts. Topics
addressed include the principles and philosophies underlying restorative
justice, differences between retributive and restorative models, victim-
offender dialogue, and offender reintegration. Students will be asked to
think critically about restorative and retributive systems and to apply
these concepts to develop their own approach to restorative justice.
Prerequisite(s): CRJ 200
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Program is

CRJ 416  Criminal Law  3 Credit Hours
A survey of the major judicial, executive, and legislative decisions in the
field of criminal law. (AY)
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 417  Crimmigration  3 Credit Hours
Full Title: Crimmigration: Intersections of Immigration and Criminal
Justice This course explores the intersection(s) of the criminal justice
and immigration systems with special attention to race, class, and
gender. It covers the evolution of American immigration policy and its
application, the criminalization of immigrants, immigrant offending and
victimization, the policing of immigrant communities, and the immigrant
experience in the United States.
Prerequisite(s): CRJ 200 or CRJ 468 or CRJ 473 or SOC 200 or SOC 201

CRJ 418  CJ Research Methods  4 Credit Hours
Full Title: Criminal Research Methods This course provides an
introduction to methods of data collection and analysis, as well as a
discussion of research design and the philosophy of social science,
within the context of the field of Criminology and Criminal Justice.
Attention is given to quantitative, qualitative, and mixed methodologies.
Prerequisite(s): CRJ 200 and CRJ 468
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 421  Group Processes  3 Credit Hours
Topics treated include group cohesiveness, “group think,” the social
structure of groups, emotional factors in group life, leadership, and
development of groups. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 423  American Social Classes  3 Credit Hours
Stratification of American communities and society. a review of the
findings of major studies and an introduction to methodology. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 425  Lab in Social Psychology  4 Credit Hours
A broad introduction to research methods in basic and applied
social psychology. Students will receive training in construction,
implementation, and interpretation of scientific procedures used in the
study of social psychology. Topics include: questionnaire construction,
experimental design, and various multivariate analytic techniques. (AY).
Prerequisite(s): PSYC 381*
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 435  Urban Sociology  3 Credit Hours
A descriptive study of the form and development of the urban community
with respect to demographic structure, spatial and temporal patterns, and
functional organization. The relationship of city and hinterland. Social
planning and its problems in the urban community. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 440  Abnormal Psychology  3 Credit Hours
An introduction to the field of psychopathology, the study of mental
disorders. Includes exposure to a number of historical and theoretical
perspectives, each with their own theories, methodologies, and
treatment approaches. Disorders covered will include: anxiety and mood
disorders, personality disorders, schizophrenia, sexual disorders, and
psychosomatic disorders. (F, W).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 443  Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood
and adolescence due to either innate physiological differences or
sociological patterning, the effect of gender roles upon male-female
relationships within our society, and the possibility of transcending
sociological gender roles in alternate modes of living. (F, W).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201 or
PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 445  Contemporary Ethical Theory  3 Credit Hours
An intensive study of a topic in recent ethical theory. Topics will vary with
each offering. Among the topics: ethics and law, utilitarianism, virtue
theory, theories of justice, morality and emotion, ethics and partiality.
(AY).
Prerequisite(s): PHIL 240
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 446  Marriage and Family Problems  3 Credit Hours
Sociological analysis of problems encountered within the institution of
marriage with particular reference to such issues as choosing a marriage
partner, sexual adjustment, occupational involvement, conflict resolution,
child rearing, divorce and readjustment. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
CRJ 447  Family Violence  3 Credit Hours
Sociological analysis of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering, and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Permission of instructor is an optional prerequisite. (YR).
Prerequisite(s): SOC 200 or SOC 201 or SOC 301 or SOC 443 or PSYC 405 or WST 405
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 453  Sociology of Law  3 Credit Hours
Various aspects of the relationship between law and society are explored. After a look at processes of law making, attention is turned to the administration of law. This involves a study of the activities of legislatures, courts, police, and correctional agents. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 455  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including: (1) formation and perseverance of immigrant communities and interethic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles. Prerequisite: ANTH 101 and junior or senior standing. (AY).
Prerequisite(s): ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 460  Law & Culture  3 Credit Hours
This course explores the ways in which legal norms, and processes are shaped by the societies in which they are created. Issues discussed may include the role of culture in criminal defenses, conflicts between religious and secular law, and how race, gender and ethnicity impact engagement with the law as lawyers and as clients. The class addresses anthropological and sociological theories about the nature of law and disputes, examines related studies of legal structure in non-Western cultures, and considers the uses of sociology and anthropology in studying our own legal system. By examining individual legal institutions in the context of their particular cultural settings, students can begin to make cross-cultural comparisons and contrasts. In doing so, the class confronts the challenge of interpreting and understanding the legal rules and institutions of other cultures while assessing the impact of our own social norms and biases. (W)
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 461  Cops & Cons: Women in Prison  3 Credit Hours
Course uses contemporary theories of gendered organizations to frame analyses of prison policies and practices in employment and incarceration as they reflect and reproduce gender inequalities. Analyses will be framed within a restorative justice model, that is, a critique of the current criminal justice system of retributive justice and a paradigm of what a alternative system could be.
Prerequisite(s): SOC 200 or SOC 201 or WST 275 or CRJ 240 or CRJ 300 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

CRJ 465  Deviant Behavior/Soc Disorganz  3 Credit Hours
General analysis of the concepts of social deviance and social disorganization: factors producing each condition, the effects of social control measures on the course of deviance and disorganization, consequences for the social system, and the relationship between the two concepts. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 466  Drugs, Alcohol, and Society  3 Credit Hours
Analyses of the sociology of substance use and abuse. Provides a sociological framework for understanding issues and evaluating our nation’s responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American society. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 467  Drugs, Crime, and Justice  3 Credit Hours
Provides a comprehensive analysis of the current state of research on interactions between crime and drug abuse. Examines drug distribution, organization of drug systems, and mechanisms of social control of drug systems. Analyzes the social problems associated with drugs and crime. The course also focuses on drug-law enforcement and public policy strategies for dealing with drugs and crime. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 468  Drugs, Crime, and Justice  3 Credit Hours
Provides a comprehensive analysis of the current state of research on interactions between crime and drug abuse. Examines drug distribution, organization of drug systems, and mechanisms of social control of drug systems. Analyzes the social problems associated with drugs and crime. The course also focuses on drug-law enforcement and public policy strategies for dealing with drugs and crime. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 469  Juvenile Delinquency  3 Credit Hours
The analysis of juvenile delinquent behavior in relationship to the institutional framework of society. Emphasis upon the more routinized and persistent forms of criminality along with the joint roles played by victims, the criminal, the police, and all other relevant parties. (F,W)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 470  Current Issues in Crim Justice  3 Credit Hours
Current issues in the field of criminal justice and law enforcement in the U.S. and other countries. Topics include an evaluation of police activities, problems of apprehension and prosecution, the courts and the correctional system, and the efficacy of the legal structure in its social context. (F,W,S).
Prerequisite(s): CRJ 200

CRJ 471  Int'l Criminal Justice Systems  3 Credit Hours
Description, analysis, and evaluation of selected criminal justice systems throughout the world. Course focuses on the various systems, theories, structures, methods and functions, including common law systems and socialist law systems. (YR).
Prerequisite(s): CRJ 200
**CRJ 472 Correctional Systems  3 Credit Hours**
Analysis of the legal, social, and political issues affecting contemporary correctional theory and practice. Topics covered include the history of corrections; the nature of existing institutions; the functions and social structure of correctional institutions; and alternatives to institutional incarceration, probation, and parole. (F, S, W).

**Restriction(s):**
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

**CRJ 473 Race, Crime and Justice  3 Credit Hours**
This course is an analysis of race and its relation to crime in the criminal justice system. Students will analyze and interpret the perceived connection between race and crime, while exploring the dynamics of race, crime, and justice in the United States. This course is designed to familiarize students with current research and theories of racial discrimination within America’s criminal justice system.

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Cannot enroll if Class is Freshman

**CRJ 474 Cyber Crimes  3 Credit Hours**
This course in a hands-on approach investigating cyber crimes (e.g. child exploitation, predators, sexual/vice crimes, identity theft, etc.). Students will explore and discuss legal cases involving cyber technology and predatory practices and review applicable evidentiary rules. Students will also analyze the practical and ethical considerations that apply to undercover internet operations, and evidence collection and use to locate and apprehend offenders.

**CRJ 475 Digital Evidence  3 Credit Hours**
This course is a detailed approach to how computers and networks function, how they can be involved in virtually any type of crime, and how they can be used as a source of evidence. Students will analyze relevant legal issues and specific investigative and forensic processes related to technology. This course examines how deductive criminal profiling, a systemic approach to focusing an investigation and understanding criminal motivations, is utilized to locate and apprehend offenders.

**CRJ 476 Inside Out Prison Exchange  4 Credit Hours**
This community-based course, taught in a local correctional facility, brings university students and incarcerated students together to study as peers. Together students explore issues of crime and justice, drawing on one another to create a deeper understanding of how these issues affect our lives as individuals and as a society. The course creates a dynamic partnership between UMD and a correctional facility to allow students to question approaches to issues of crime and justice in order to build a safer and more just society for all. The course encourages outside (UMD) students to contextualize and to think deeply about what they have learned about crime and criminals and to help them pursue the work of creating a restorative criminal justice system; it challenges inside students to place their life experiences into larger social contexts and to rekindle their intellectual self-confidence and interest in further education.

**Restriction(s):**
Can enroll if Class is Junior or Senior

**CRJ 478 Criminal Justice Internship  3 to 6 Credit Hours**
Provides field experience in social welfare or criminal justice agencies, e.g., for children/adolescents, in residential programs, in abuse remediation, in probation, for chemical dependencies, in victim advocacy, for the elderly, in prisons, for special needs populations, in court services, in medical/public health, in police services, and for families and communities. Supervision by approved field instructors. An internship of 80 hours is required for three (3) credits. Instructor and student will work together to determine appropriate intern placement. Approval of instructor. (F,W).

**Prerequisite(s):** CRJ 200

**CRJ 479 Women’s Studies Internship  3 Credit Hours**
Provides field experience in social welfare agencies, e.g., for children/adolescents, abuse, chemical dependencies, the elderly, special needs populations, criminal justice/probation, medical/public health, and families and communities. Supervision by approved field instructors. Focus is on analysis of the social context of agency, the clients, and staff. An internship of 80 hours is required for three (3) credits. Prerequisite: WGST 275 and permission of the Women’s Studies Director is required. (F, W).

**Prerequisite(s):** WST 275

**CRJ 480 Criminal Justice Theory  3 Credit Hours**
Criminal Justice theorists study of formal and informal mechanisms of social control in specific places, such as bars and night clubs, city parks, schools and shopping malls. Students in this course will learn to apply their theories to practical, real life situations to achieve behavioral changes among individuals and groups toward the objective of effective crime control.

**Restriction(s):**
Cannot enroll if Major is

**CRJ 481 Terrorism & US Natl Security  3 Credit Hours**
The United States responded to the events of September 11, 2001 with a series of unprecedented action under the umbrella of homeland security and the War on Terror. This course examines American National security policy by asking a few key questions: What is terrorism and how does it threaten the United States? How has the United States responded to the threat of terrorism over time? What have the consequences of US policy been to date? Finally, how would we balance a desire for security with our desire for civil liberties and ethical action?

**Prerequisite(s):** CRJ 468

**CRJ 482 Legal Ethics  3 Credit Hours**
This course will explore the many ethical dilemmas faced by professionals in the legal system. We will pay particular attention to the criminal justice system and to the Rules of Professional Conduct for attorneys. Some of the questions we may address are: How should an attorney consider his/her own ethical beliefs when deciding the appropriate course of action in a case? How should a judge consider his/her own ethical beliefs when making a juvenile justice decision? How should a police officer determine the ethical course of action when the law’s instructions are ambiguous?

**Restriction(s):**
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Undergraduate
CRJ 483  Justice, Crime and Environment  3 Credit Hours
This service-learning course focuses on environmental justice and law. Environmental Justice is defined as the fair treatment of all people with respect to the development, implementation, and enforcement of environmental laws. In the classroom, students learn the theory, history, and enforcement of environmental laws and regulations in Detroit, Michigan, and nationwide. In a required civic engagement project, students apply their substantive knowledge to solve local environmental problems. Through classroom learning and projects with community organizations, students connect law and justice concerns to Detroit's environmental problems.
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 484  White Collar Crime  3 Credit Hours
This course reviews the history, categories, and problems related to white-collar crime. The course covers these topics by incorporating both legal and empirical perspectives in the study of white collar crime. In this course, we will focus on the substantive and procedural white collar crime laws ('law on the books') and analyze real white collar crime cases. Simultaneously, we will pay special attention to the dynamic relationship between white collar crime and the American regulatory framework. As a result, we will assess the relationship and differences between various types of white collar crime and the regulatory regimes that oversee the business sector ('law in action'). (OC)

CRJ 485  Psychology Internship  3 or 6 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, geriatrics, human resources/ staff development, mental retardation, probation departments, teenage runaways, substance abuse, and women's issues. The program is designed for juniors and seniors with a concentration in psychology or behavioral sciences and involves training in listening and helping skills. Written permission of instructor required. (FW).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 486  Criminalistics: CSI to Justice  3 Credit Hours
This course is a hands-on approach to learning about crime scene investigation. The course takes the student from the first response on the crime scene to documenting crime scene evidence and preparing evidence for courtroom presentation. It includes topics such as arson, homicide, suicide, and felony murder. CRJ 486 examines how the police conduct successful investigations, how the associated crime scene evidence is collected, and how to use the evidence to locate, apprehend, and prosecute the suspect.
Prerequisite(s): CRJ 200

CRJ 487  Forensic Science  3 Credit Hours
This class is a study of the increasing use of scientific evidence in criminal cases, gathered by crime scene investigators (CSI) and/or later developed in a crime laboratory. After a review of the history and development of forensic scientific evidence, the class will study the standards used by courts to prevent the admission of so-called "junk science" and the emergence of DNA as a new model for forensic science evidence. Several common forms of scientific evidence, beginning with DNA, will be studied, including fingerprints, handwriting, hair, bite marks, ballistics, fire and arson debris, and blood stains. The study also includes the forensic use of social sciences testimony, including the reliability of eyewitness testimony and several forms of abuse "syndrome" testimony. Each of these forms of evidence will be described and then compared to the "junk science" standards and to the most recent information about their reliability. The class will examine the impact of forensic science evidence on juries and the so-called "CSI Effect". The reaction of courts, attorneys and police to juror expectations for scientific evidence will be reviewed. Finally, the class will review the impact of DNA exonerations and the National Academy of Sciences report on the reliability of forensic science evidence and how judges and appeals courts are responding to those challenges, particularly the current controversies concerning over the validity of such violence. (W)

CRJ 488  Criminal Procedure  3 Credit Hours
This class is a study of Constitutional law regarding criminal procedure in the United States. Initially the class reviews the federal and state court structure relating to criminal prosecutions and the flow of cases through those systems. The focus is then on the nature of individual rights under the Constitution, the case law, and the concept of the "exclusionary rule." The class then examines specific issues and procedures relating to arrests, searches, confessions and identifications, and analyzes the constitutional requirements for each. (W)

CRJ 489  Law, Crime, and Society  3 Credit Hours
This course will incorporate both legal and empirical perspectives to emphasize the dynamic relationship between law, crime, and society. In this course, we will focus on the substantive and procedural criminal law ('law on the books') while we simultaneously focus on empirical research of enforcement, case processing and sentencing in the criminal justice system (the 'law in action'). As a result, we will assess the relationship and differences between what the criminal law says 'on the books' and the criminal justice system 'in action'.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

CRJ 490  Topics in Criminal Justice  3 Credit Hours
Examination of problems and issues in selected areas of criminal justice. Title as listed in Schedule of Classes will change according to the content of the course. Course may be repeated when specific topics differ.
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

CRJ 494  Pol Sci Internship Seminar  3 or 6 Credit Hours
This is the academic part of the internship. Students must meet with other interns once a week to analyze political dynamics within their placements. Students are required to keep journals, prepare papers and reports, and do other written work. Anyone taking POL 495 or 496 is required to take POL 494. It may not be taken by itself. Repeatable if topic differs. Only six hours of internship credit is allowable toward concentration requirement. (F,W,S).
**Decision Sciences (DS)**

**DS 300** Quantitative Model and Anly I 3 Credit Hours
To introduce fundamental concepts and methods in data analysis, probability, estimation, and statistical inference for application in management and management science. Topics include: basic probability theory, discrete and continuous random variables and distributions, sampling and data analysis, sampling distributions, estimation, confidence intervals and hypothesis testing, introductory regression analysis and utilization of statistical software packages.

**Prerequisite(s):** MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 115

**Restriction(s):**
Can enroll if Class is Sophomore or Junior or Senior

**DS 301** Intro Business Statistics 3 Credit Hours
Introductory concepts and methods in data analysis and probability, together with their applications to business. Students will be introduced to the use of Excel@ to analyze data and communicate data to a business audience through statistical reports. Topics covered are data generation and categorization; visualizing data; numerical descriptive measures; basic probability; random variables (discrete and continuous); and an introduction to sampling methods and sampling distributions.

**Prerequisite(s):** (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 115) and ITM 120

**Restriction(s):**
Cannot enroll if Class is Freshman

**DS 302** Advanced Business Statistics 3 Credit Hours
Full Title: Advanced Business Statistics using Excel The continuance of DS301: an introduction to the use of estimation and statistical inference in data analysis using Excel and other appropriate statistical packages, with applications to business. Statistical report writing for a business audience will be emphasized. Topics covered are sampling distributions; confidence interval estimation; hypothesis testing (one-sample tests, two-sample tests, Chi-square test, and analysis of variance); and regression models.

**Prerequisite(s):** DS 301

**DS 310** Data Mining for Bus Intel 3 Credit Hours
Data Mining offers a suite of analytical techniques to examine large sets of data in order to discover, diagnose, and identify new and valuable information to aid the decision-making process. This course is designed to introduce the core concepts of data mining, its techniques, implementation, benefits and outcomes from this technology. Examples from industries such as, retail, marketing, fraud protection, personal security, health care, web and e-commerce will be presented throughout the course to emphasize usage and application of data mining. Among data mining techniques to be discussed in the course are k-means clustering, principal component analysis, factor analysis, linear and logistical regression, neural networks, decision trees, text and web mining. The class format consists of discussion of published articles/cases, presentations by business professionals, class lectures and discussions, and hands-on work with popular data mining software.

**Prerequisite(s):** DS 300 or DS 302 or STAT 325 or IMSE 317

**DS 350** Quantitative Model and Anly II 3 Credit Hours
To continue from DS 300, during the first half of the course, the study of the concepts and methods in data analysis and statistical inference, as well as to introduce, in the second half of the course, basic linear optimization methods and models applied in the formulation, quantification, analysis, and solution of management decision problems. Topics include: simple and multiple linear regression, analysis of variance, sampling, correlation, formulation and solution of linear programming problems, transportation and transshipment models, utilization of software packages for statistical analysis and optimization.

**Prerequisite(s):** DS 300

**DS 425** Optimization Modeling and Anly 3 Credit Hours
To continue, from DS 350, the study of optimization methods and models applied in the formulation, quantification, analysis and solution of management decision problems. Topics include: network analysis (including PERT-CPM), goal and multi-objective linear programming, integer programming, dynamic programming, Markovian decision processes, nonlinear programming.

**Prerequisite(s):** DS 350

**DS 426** Introduction to Simulation 3 Credit Hours
To introduce the concepts and methods of discrete-event simulation for the modeling and analysis of complex systems. Topics include: basic simulation modeling, modeling complex systems, simulation languages, selection of input probability distributions, random-number generators, generating random variable values, output data analysis for a single system, statistical techniques for comparing alternative systems, validation of simulation models, variance-reduction techniques, experimental design and optimization.

**Prerequisite(s):** DS 350
ECON 201  Prin: Microeconomics  3 Credit Hours
Together with ECON 202, this course serves to introduce the student to the basic ideas and concepts of modern economic analysis, and applies them to current economic problems, policies, and issues. The focus of this course is on microeconomics, the behavior of consumers and firms and their interactions in specific markets. It is recommended that students take ECON 201 before ECON 202. MATH 104 or 105 is highly recommended but not required. (F,W,S).

ECON 202  Prin: Microeconomics  3 Credit Hours
Together with ECON 201, this course serves to introduce the student to the basic ideas and concepts of modern economic analysis, and applies them to current economic problems, policies, and issues. The focus of this course is on microeconomics, the behavior of consumers and firms and their interactions in specific markets. It is recommended that students take ECON 201 before ECON 202. MATH 104 or 105 is highly recommended but not required. (F,W,S).

ECON 290  Topics in Economics  3 Credit Hours
Examination of problems and issues in selected areas of economics. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

ECON 301  Intermediate Macroeconomics  3 Credit Hours
A systematic study of the determinants of national output, economic growth, inflation, and unemployment. The effects of monetary policy, fiscal policy and other economic factors are analyzed for both the long run and short run. Debates about various approaches to macroeconomics policy are also discussed. (F,W).

Prerequisite(s): ECON 201 and ECON 202 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 113)

ECON 302  Intermediate Microeconomics  3 Credit Hours
A systematic study of the role of prices in organizing economic activity. The tools necessary for such study will be developed and applied to the analysis of the household, the firm, and the market under varying degrees of competition and monopoly. (F,W).

Prerequisite(s): ECON 201 and ECON 202 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 113)

ECON 305  Economic Statistics  3 Credit Hours
Introduction to the logic and use of statistical analysis, with emphasis on statistical inference. Topics covered include descriptive statistics, probability, estimation, hypothesis testing, and the use of linear regression analysis to study relationships between two variables. (F,W).

Prerequisite(s): ECON 201 and ECON 202 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 113)

ECON 311  Money and Banking  3 Credit Hours
The structure, workings, and regulation of financial systems, concentrating on bank-like financial institutions. While financial instruments like stocks, bonds, and some derivatives are discussed, the focus is on the economic theory behind financial markets. That is, the study of monetary policy underscores the interaction between the financial system and the economy. (F,W).

Prerequisite(s): ECON 201

ECON 321  Labor in the American Economy  3 Credit Hours
An analysis of the nature and underlying causes of the problems facing the worker in modern economic society. Includes an examination of wages, unemployment, economic insecurity, the trade union movement, collective bargaining, and labor legislation. (F,W).

Prerequisite(s): ECON 201 and ECON 202

ECON 325  Economics of Pov and Discrm  3 Credit Hours
An analysis of the economic aspects of poverty and discrimination. Emphasis on the theoretical economic causes of poverty and the economic bases for discriminatory behavior, the impact of poverty and discrimination on individuals and society, and the effect of reform policies on the two problems. (AY).

Prerequisite(s): ECON 201 and ECON 202
ECON 331  Industrial Organization  3 Credit Hours
Theory and empirical evidence on the causes and effects of market power, especially in industrial markets. The focus is on the relationships between market structure and performance, and policy formation. (YR).
Prerequisite(s): ECON 202

ECON 335  Experimental Economics  3 Credit Hours
This course on experimental economics is devoted to laboratory experiments on individual behavior in markets as well as in social situations. It focuses on different forms of strategic interactions between agents, including competition, coordination, bargaining, and public choice. We will consider individual decision experiments, choice anomalies, and the role of information in learning and signaling. We will also discuss the design of various economic experiments, such as market bargaining, auctions, trust, gift giving, adverse selection, public goods, common pool resources, etc. Students are recommended (but not required) to take Econ 302 before enrolling in this class. Basic knowledge of Excel is required for this class.
Prerequisite(s): ECON 202 or ECON 2001
Restriction(s):
Cannot enroll if Class is Freshman

ECON 351  Environmental Economics  3 Credit Hours
Course examines the economic aspects of pollution problems. Topics covered in this course include the economic theory of externalities, the theory of public goods, and the optimum use of depletable natural resources. The role of cost-benefit analysis as a part of the decision-making process is also examined. (AY).
Prerequisite(s): ECON 202

ECON 355  Health Economics  3 Credit Hours
Course examines the health of a population and the health care industry, using the tools of economic analysis. Topics include the demand and supply of health services, alternate ways of financing health care, the application of cost-benefit analysis to health projects, and comparative health economic systems (e.g., Britain, Sweden). (AY).
Prerequisite(s): ECON 202

ECON 361  US Economic History  3 Credit Hours
A survey of the processes of development of the United States economy, their social implications, and the sources of today’s economic problems. (YR).
Prerequisite(s): ECON 201 and ECON 202

ECON 362  Eur and Intl Economic Hist  3 Credit Hours
A survey of the processes of industrialization in the major non-American industrial economies, with a focus on their relevance and implications. (AY).
Prerequisite(s): ECON 201 and ECON 202

ECON 372  Economic Demography  3 Credit Hours
Course offers an introduction to economic demography, focusing on the interrelation between economic and population variables, and the techniques of demographic analysis. (OC).
Prerequisite(s): ECON 201 and ECON 202

ECON 375  Heterodox Economics  3 Credit Hours
This course introduces students to alternative perspectives on economic theory and method. These alternatives include: Marxian and radical political economics, institutional and evolutionary economics, behavioral economics, post-Keynesian economics and feminist economics. (OC).
Prerequisite(s): ECON 201 or ECON 202 or ECON 2001

ECON 385  Public Choice  3 Credit Hours
Public policy decision making, particularly governmental decisions regarding economic policies. Emphasis is on the use of economic methodology to analyze resource allocation via the political system rather than through private markets. (OC).
Prerequisite(s): ECON 201 and ECON 202

ECON 390  Topics in Economics  1 to 3 Credit Hours
Examination of problems and issues in selected areas of economics. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

ECON 390H  Topics in Economics  3 Credit Hours
Topic: The Economics of Religion, Crime, and Marriage. This course uses the tools of economics, particularly microeconomics, to explain key characteristics of religion, criminal behavior, and marriage. For religion, the course will explore church organization, church architecture, beliefs about the afterlife, doctrine about usury, and religious market structure, among others. For crime, the course will evaluate claims about the death penalty, gun control and the demand for crime. For marriage, the course will analyze multiple, marriage payments, family organization, and marriage for love, among others.
Prerequisite(s): ECON 202

ECON 390M  Topics in Economics  3 Credit Hours
Topic Title: Comparative Institutions: Cuba, the US and More. This course will analyze different institutions. This will range from colonialism to the mafia to prison gangs to economic development. A significant part of the class will be a spring break trip to Cuba. Before we go we will study the institutional literature on democracies and dictatorships and then spend a week traveling around one of the last communist countries that still exists.

ECON 398  Economics Internship  3 to 6 Credit Hours
This internship affords the student the opportunity to apply tools learned in economics courses to real-world work situations. The student has 8-16 hours of unpaid work per week under the guidance of a faculty advisor and complementary academic work supervised by an economics professor. Only three credit hours may be applied to meeting the concentration requirements in economics; up to six credit hours may be applied toward graduation credit. The internship is offered only on the S/E grading basis. Students cannot receive credit for both ECON398 and ECON498.(F,W,S). 3.000 TO 6.000 Credit hours

ECON 4011  Monetary Economics  3 Credit Hours
This course examines financial institutions in a macroeconomic theoretical context. A rigorous treatment of monetary theory is presented followed by practical discussion of U.S. monetary policy as implemented by the Federal Reserve System. Students cannot receive credit for both ECON 4011 and ECON 411.
Prerequisite(s): ECON 311 and ECON 301
Restriction(s):
Can enroll if Level is Undergraduate

ECON 4015  Introduction to Econometrics  3 Credit Hours
The theory and practice of the statistical analysis of economic relationships. Topics covered include the construction and estimation of econometric models and tests of economic theories, emphasizing the use of multiple linear regression. Students cannot receive credit for both ECON 4015 and ECON 415.
Prerequisite(s): MATH 113 or MATH 115 and ECON 305
Restriction(s):
Can enroll if Level is Undergraduate
ECON 4021 Economics of the Labor Sector  3 Credit Hours
Theoretical analysis and empirical studies of the nature and operation of labor markets. Includes theories of wage determination and income distribution, the nature of unemployment, the impact of collective bargaining on the economy, the extent and economic effects of discrimination, and the nature and effects of government wage and employment policies. ECON 321, Labor in the American Economy, is valuable background to this course although it is not a prerequisite. This course counts as a required capstone (4000-level) course in Economics and also counts toward the Economics Honors designation. Students cannot receive credit for both ECON421 and ECON4021.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Level is Undergraduate

ECON 4065 History of Economic Thought  3 Credit Hours
Course examines the evolution of economic thought and theory from the early origins to the present, focusing on the major contributions to economics, especially from Adam Smith onward, and assesses the current condition of economic analysis. Students cannot receive credit for both ECON 465 and ECON 4065.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Level is Undergraduate

ECON 407 Cost-Benefit Analysis  3 Credit Hours
Cost-benefit analysis arguably is the most important tool in evaluating public and private policies. Conceptually, cost-benefit analysis is simple: subtract the costs from the benefits and adopt those policies yielding the greatest net benefit. In practice cost-benefit analysis is much more complicated. Costs and benefits must be summed over time, requiring a calculation of net present value. Costs and benefits must be summed over different people, requiring a social welfare function. Finally costs and benefits must be summed over a variety of goods and services, some of which do not have market values or where market values are not appropriate measures. This course reviews the techniques involved in cost-benefit analysis and employs case studies to illustrate these techniques. (AY)
Prerequisite(s): ECON 202 and ECON 302
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

ECON 4085 Public Finance  3 Credit Hours
Analysis of the role of government in the economy. Course examines theories of the need for and nature of government intervention in economic activities. Includes analysis of public goods, externalities, taxation, state, and local finance, and models of public decision making. Students cannot receive credit for both ECON 4085 and ECON 481.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Level is Undergraduate

ECON 433 Antitrust and Regulation  3 Credit Hours
This course uses economic theory to examine major antitrust laws and to evaluate government regulation of industry. ECON 331, Industrial Organization, is valuable background to this course although it is not a prerequisite. Students cannot receive credit for both ECON433 and ECON333. (OC).
Prerequisite(s): ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 437 Behavioral Public Policy  3 Credit Hours
This course teaches you to apply the insights from behavioral economics and psychology to public policy design. Empirically-based behavioral science offers policy makers the opportunity to decrease the impact of psychological limitations of lazy or boundedly rational individuals. In this course we consider various public policies that are informed by behavioral science research in the areas of retirement savings, household borrowing, health care, energy use and choice of nutrition. Graduate version of the course requires completion of additional assignments. 
Prerequisite(s): ECON 201 and ECON 202 or PPOL 500
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

ECON 438 Beh Econ for Business & Policy  3 Credit Hours
This course is a reading intensive seminar on behavioral economics, which is the combination of psychology and economics that investigates what happens in markets in which some agents display human limitations and complications. The course focuses on the behavioral economics theory and its' application to business practice and policy decision making. Specifically, in this course we: (1) examine the ways in which people deviate from the standard economics models, including irrationality, preferences for fairness, propensity to cooperate, trust, dual-interest, empathy and emotions; (2) explore behavioral economics theories and models; (3) discuss how the behavioral economics theories and models can be applied to solve business and policy problems. Graduate version of this course requires completion of additional assignments. Students cannot receive credit for ECON 336 and ECON 438 or ECON 538. (FW,AY)
Prerequisite(s): ECON 202 or ECON 2001
Restriction(s):
Cannot enroll if Class is Freshman

ECON 442 Economic Development  3 Credit Hours
A survey of economic problems currently affecting third world countries and the various policy options available to them. Topics covered will include agrarian vs. industrial growth, and monetary and fiscal policies, planning problems, foreign exchange and debt problems. Students cannot receive credit for both ECON 442 and ECON 342 (OC).
Prerequisite(s): ECON 201 or ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 444 Economies of the Middle East  3 Credit Hours
Survey of socio-economic issues of the post-WWII Middle East, using textbooks and web-based readings. Topics include population growth, urbanization, migration, gender issues, land reform, privatization, and stabilization policies. The Arab-Israeli conflict is not a focus of study. Grade based on papers and exams. Students cannot receive credit for both ECON 344 and ECON 444.
Prerequisite(s): ECON 201 or ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 447 International Finance  3 Credit Hours
This course studies the large-scale economic issues in interdependent economies, such as the behavior of exchange rates, interest rates, income, wealth, prices, and the balance of payments. International finance focuses particularly on economic policies in a world with a multitude of currencies and increasingly integrated goods, financial, and capital markets. Students cannot receive credit for both ECON 447 and ECON 347.
Prerequisite(s): ECON 201
Restriction(s):
Can enroll if Level is Undergraduate
ECON 448  International Trade  3 Credit Hours
Course analyzes in depth the debate of free trade vs. protectionism. Different theoretical models of the "gains from trade" are presented, as well as studies of their empirical validity. Some historical perspective is included, as well as discussion of the current situation of the European Union. Students cannot receive credit for both Econ 348 and Econ 448.
Prerequisite(s): ECON 201 and ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 482  Regional Economics  3 Credit Hours
Course explores methods of economics evaluation of regions in terms of intra- and inter-regional activity. Regions may smaller than a nation, be a collection of nations, or be composed of portions of more than one nation. Theoretical topics include the theories of (1) the location of the firm, (2) spatial demand, (3) agglomeration economies, and (4) input-output analysis. Regional development policy is discussed using Michigan and Ontario as subjects. Students cannot receive credit for both ECON 382 and ECON 482.
Prerequisite(s): ECON 201 or ECON 202 or ECON 2001
Restriction(s):
Can enroll if Level is Undergraduate

ECON 483  Urban Economics  3 Credit Hours
The economics of the city and the introduction of space in economic analysis; the determination of land use patterns, the location of firms and industries, and an urban area's growth; economic analysis and policy issues concerning urban poverty, housing, transportation, the local public sector, and other urban problems. Students cannot receive credit for both ECON 483 and ECON 381.
Prerequisite(s): (ECON 201 and ECON 202) or ECON 2001
Restriction(s):
Can enroll if Level is Undergraduate

ECON 497  Economics Seminar  3 Credit Hours
An advanced study in selected areas of Economics. Topics vary; see the current Schedule of Classes for topics and prerequisites. May be offered in satisfaction of 400-level elective requirement for concentration. (OC).
Restriction(s):
Can enroll if Level is Undergraduate

ECON 499  Directed Research  1 to 3 Credit Hours
Independent study under the direction of a faculty supervisor in advanced topic areas. Normally must be elected on the "pass/fail" option, in which case it does not count toward credit hour requirement for concentration. Special consideration for the A through E grading option must be approved by members of the Economics discipline. In all cases students must have faculty supervisor's permission to register.
Restriction(s):
Can enroll if Level is Undergraduate

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

An asterisk denotes that a course may be taken concurrently.

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Frequency of Offering

Educ A-Theoretical Foundatns (EDA)

EDA 205  Introduction to Education  3 Credit Hours
This course is designed to introduce students to the field of education. In this course students will gain a working knowledge of teacher certification and professionalism, state standards, and high-stakes testing. Additionally, students will be introduced to basic forms of lesson planning, classroom assessment, and instructional techniques. As a part of the course, all students will begin to use the M-Portfolio system. Students will also carryout assignments in schools and therefore must complete the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent). For more information access the Field Placement Office website at: www.udearborn.edu/ccehs/cehhs_fac
Prerequisite(s):
Cannot enroll if Class is Post-baccalaureate NCED or Undergraduate NCED or Graduate

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

EDA 340  Foundations of American Ed  2 to 3 Credit Hours
A general survey of education's theoretical and structural foundations. This course introduces students to the history and philosophy of education as well as to the organization and financing of schools in America. Particular attention will be given to the role of education in a democratic society and to the notion of teaching as a profession.
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Freshman or Junior or Senior

EDA 419  Early Literacy/Language Devel  3 Credit Hours
This course examines early language development, the factors that contribute to its growth and the role that it plays in the development of literacy. Diagnostic techniques for assessing language and literacy and teaching strategies and materials to facilitate language and literacy growth in children birth through third grade will be discussed.
Restriction(s):
Cannot enroll if Class is Freshman or Graduate

EDA 450  Hist/Theory of Bilingual Educ  2 to 3 Credit Hours
The course provides an extensive background on bilingual education (programs where two languages are used as media of instruction) in the United States, and the events that led to the inception of such programs on the Federal as well as the State levels. The course provides a background on the concept itself, its rationale and implementation.
Restriction(s):
Can enroll if Class is Junior

EDA 455  Lang,Culture,Litracy & Power Ed  3 Credit Hours
Full Course Title: Seminar in Language, Culture, Literacy and Power in Education During this course we will examine the social/cultural functions of language with an emphasis on schools and other applied educational settings. Through our readings, discussions, and class activities, students will gain a greater appreciation for the ways in which language varies across cultures, social settings, and situations. (YR)

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Educ B-Educational Admin (EDB)**

**EDB 421**  
**Current Issues in Early Ed**  
2 Credit Hours  
Examines the expanding field of early childhood in order to understand major issues which are shaping the development and support of early education and child care programs. Designed for present and future teachers, administrators, and other workers in the field of early childhood, and for the general public who must participate in major pending decisions relating to such questions as proposed changes in state licensing, teacher certification, and funding sources.  
**Prerequisite(s):** EDC 240  
**Restriction(s):**  
Can enroll if Class is Undergrad Certification only or Undergrad Certification only or Junior

**EDB 422**  
**Lead,Advoc, Admin Early Ch Prg**  
3 Credit Hours  
This course promotes role of the early childhood educator as a leader and advocate for young children and families. Designed for present and future teachers, administrators and other professionals who participate in decisions relating to public policy and legislation, state licensing, teacher certification, funding resources, parental involvement and other issues affecting young children and families.  
**Prerequisite(s):** EDB 421  
**Restriction(s):**  
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Certification only or Junior or Senior

**Educ C-Psychological Foundatns (EDC)**

**EDC 240**  
**Psych of Child Development**  
3 Credit Hours  
An introductory presentation of facts and theories concerning the development of the child from birth through adolescence. The practical applications of present knowledge in this field will be examined. Field observations and directed interactions with children required. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent).  
**Prerequisite(s):** Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1  
**Corequisite(s):** EDC 241  
**Restriction(s):**  
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Certification only or Freshman or Sophomore or Junior or Senior

**EDC 241**  
**Psych: Child Devel Practicum**  
1 Credit Hour  
A supervised field experience related to the study of child development. Requires a minimum of 45 clock hours of observation and work spread over a semester in an early childhood setting. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent).  
**Prerequisite(s):** Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1  
**Corequisite(s):** EDC 240  
**Restriction(s):**  
Can enroll if Class is Freshman or Sophomore or Junior or Senior  
Can enroll if College is Education, Health, and Human Services

**EDC 300**  
**Educational Psychology**  
3 Credit Hours  
Consideration of research findings relevant to the learner in the classroom with emphasis on factors that influence learning. Topics include: the teacher trainer's role in motivation; formulation of generalizations pertaining to the physical, mental, social, and emotional development of learners; analysis of selected aspects of the teaching-learning situation including the dynamics of interaction, classroom control, guidance, and appraisal of growth.  
**Restriction(s):**  
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior  
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

**EDC 301**  
**Practicum in Ed Psychology**  
1 Credit Hour  
A supervised field experience related to the study of educational psychology involving a minimum of 45 clock hours of participation/observation and work spread over a semester in a school setting. TB clearance and criminal background check are required.  
**Prerequisite(s):** PSYC 170 or PSYC 171  
**Restriction(s):**  
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Certification only or Junior or Senior  
Can enroll if College is Education, Health, and Human Services
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**EDC 302 Adol Devl & Classroom Mgmt 3 Credit Hours**

An examination of the current theories and research findings concerning the physical, social, emotional, and cognitive development during the early and late adolescent years. Theory will be related to educational and parenting practices. Significant material will be included addressing classroom management of the middle school and high school classroom using simulation, case studies and videos of actual classrooms.

**EDC 306 Applied Behavior Analysis I 3 Credit Hours**

This is the first in a two course sequence in applied behavior analysis, focusing on best practices and current research. General topics to be covered include principles of learning, research methods in applied behavior analysis, skills training and stimulus control techniques, interventions for problem behavior, ethical issues, and the application of behavior analysis across a wide range of populations, settings, and behaviors.

**EDC 307 Applied Behavior Analysis II 3 Credit Hours**

This is the second in a two course sequence in applied behavior analysis (ABA) that focuses on the application of the fundamental principles, processes, and concepts of the field that were covered in Applied Behavior Analysis I. Through discussion, demonstration, and analysis, students will learn about specific behavior change procedures based upon the principles of ABA and the process for selecting and implementing those procedures.

**EDC 308 Intro Dev Disabilities 3 Credit Hours**

This course provides an overview of the issues related to the diverse group of individuals with developmental disabilities. Topics include the history and public policy issues related to this population. Special consideration will be given to familial issues within the context of socio-cultural issues and the role of families in the provision of services across the lifespan. Students will be exposed to the range of assessment practices for developmental disabilities, including intellectual, adaptive behavior, psychosocial, behavioral, psychoeducational, and developmental.

Specific conditions under the category of developmental disabilities are covered, along with the diagnostic criteria for these conditions. Other topics include educational and behavioral interventions, person centered planning/family centered support, post-school and adult issues, physical and mental health issues, services and supports to improve quality of life, controversial therapies, and ethical issues for individuals with developmental disabilities.

**EDC 310 RBT Training 3 Credit Hours**

This course provides a practical working knowledge of the basic principles of Applied Behavior Analysis (ABA) in preparation for participants to take the RBT Competency Assessment. This training program is based on the Registered Behavior Technician Task List set forth by the Behavior Analysis Certification Board (BACB) and is designed to meet the 45-hour training requirement for the RBT credential. The program is offered independent of the Behavior Analyst Certification Board (BACB).

**EDC 320 Intro to Ethics for ABA 1 Credit Hour**

This course introduces students to current theory and practice for understanding and working with adult learners in today's society.
EDC 401 Introduction to LD 3 Credit Hours
Introduction to LD is designed to provide students with an overview of the field of learning disabilities. Discussions will include physical, social, emotional, and cognitive comparisons of developmental differences and similarities between persons of all ages with and without LD, historical and theoretical perspectives, current trends and issues, assessment, and collaboration among educators.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Post-baccalaureate NCFO or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDC 402 Research Methods Beh Analysis 3 Credit Hours
The purpose of this course is to introduce you to the fundamentals of behavior-analytic research methods. The course will review single-case time series methodologies to assess various dimensions of behavior and evaluate the effects of interventions of behavior. Single-case research has played an important role in developing and evaluating interventions designed to modify some aspect of human behavior. This course will encompass a broad range of research areas that utilize single-case designs within both the behavior analytic literature and other disciplines including school psychology, medicine, and business. (F, S)
Prerequisite(s): EDC 306

EDC 410 Dev Peer/Social Relationships 2 Credit Hours
Students will examine the processes of peer relations and socio-emotional development from birth to adolescence. Topics to be covered in this course include attachment, peer popularity and intimacy. As well, students will discuss the importance of the family on social development. Classroom environment and peers as educators will also be covered.
Prerequisite(s): EDC 340 or EDC 240

EDC 412 Social Devl/Pos Guidnce Techn 3 Credit Hours
This course will examine the process of social and emotional development in childhood through adolescence. Positive strategies to promote and guide this development in the classroom will be explored using behaviorist and constructivist frameworks. Topics will include character education, discipline models, conflict resolution and family collaboration. Guiding the development of emotional regulation, perspective taking and peer relationships in children including children with special needs will be investigated.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if Degree is *Teacher Certificate, Bachelor of Arts
Can enroll if College is Education, Health, and Human Services

EDC 414 Early Child Ed Special Needs 3 Credit Hours
Focuses on the psychological and educational needs of the young child with special needs. Discusses identification techniques and educational strategies for teaching in a regular early childhood classroom with young children having special needs. Special emphasis will be placed on behavioral, linguistic, and intellectual areas. Suitable for classroom teachers, childcare directors, and teachers in training.
Prerequisite(s): EDC 540 or EDC 340 or EDC 240
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Sophomore or Junior or Senior

EDC 417 Mgmt of Classroom Behavior 3 Credit Hours
Provides intervention and management techniques for teachers and teacher candidates using principles of behavior modification. Includes examination of theoretical foundations, research and field reports, participation in self-management projects, and consideration of various applications in regular and special classrooms. Field experience is optional. Course will focus on classroom management in early childhood and elementary environments, allowing a more focused examination of topics and case studies geared to those grade levels. (OC)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

EDC 420 Hum Sexuality:Psyc-Ed Concepts 2 Credit Hours
The course is intended to acquaint elementary and secondary teachers with the elements that comprise sexuality as it relates to their lives and those of their students. Although a basic core of information is to be covered, the content of each class will provide for the needs and interests of the teachers. Teachers will be directly involved in identifying problems and the development and collection of strategies for problem resolution.
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

EDC 425 Treat Plan/Eth Prof Cond ABA 3 Credit Hours
Full Title: Treatment Planning/Ethical and Professional Conduct in Applied Behavior Analysis. This course provides a comprehensive approach to treatment planning in Applied Behavior Analysis. The course addresses application of the principles of Applied Behavior Analysis to intervention, assessment, implementation, evaluation, program continuation/maintenance, and data-based clinical decision making. Central to treatment are ethical responsibilities for Applied Behavior Analysts. The Professional and Ethical Compliance Code for Behavior Analysts, as put forth by the Behavior Analyst Certification Board is addressed. Throughout the course, the behavior analytic literature is used as the basis for all coursework, discussion, and evaluation. (YR)
Prerequisite(s): EDC 306

EDC 431 Constructivist Education 3 Credit Hours
An examination of constructivist theory and its application to educational practices. The nature and stages from birth through adolescence of cognitive and social development from the constructivist viewpoints of Piaget, Vygotsky, and others will be discussed. The major focus will be the application of constructivist theory to educational goals, teaching strategies and curriculum. (OC)
Prerequisite(s): (EDC 340 or EDC 240) and (EDC 341 or EDC 241)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

EDC 439 Child Maltreatment and Trauma 3 Credit Hours
This course will examine adverse childhood experiences, including the impact of physical abuse, neglect, sexual abuse, and other forms of psychological trauma. Particular emphasis will be placed on the role of trauma informed professionals to identify, assess, and support the needs of children, youth, and families impacted by trauma and child maltreatment. This course will explore various levels of prevention, intervention, and collaborative response to suspected cases of child maltreatment by multi-disciplinary teams, including investigation and treatment. (YR)
EDC 440  The Child: Birth to Three   3 Credit Hours
Full Course Title: The Developing Child: Birth to Three: An examination of current theories and findings concerning the physical, social, emotional, and intellectual development of the young child from prenatal to three years of age. Topics include fetus maturation, capabilities of the newborn, language, cognition, and environmental influences on development. Theory will be related to infant care practices in the home and in early childhood centers.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergraduate NCFD or Undergrad Certification only or Post-baccalaureate NCFD or Sophomore or Junior or Senior

EDC 442  EC: Fam/Sch/Comm Collaboration   3 Credit Hours
Focuses on factors that influence the building of partnerships among early childhood professionals, families, and communities. Includes understanding and working with culturally and linguistically diverse families. Various communication and problem-solving strategies that promote family involvement and community outreach are practiced through discussion and role play.
Prerequisite(s): (EDC 340 or EDC 240) and (EDC 341 or EDC 241)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDC 443  Family/School/Community Collab   2 Credit Hours
Characteristics, roles, and functions of contemporary families are described. Various communication and training strategies designed to promote collaboration and teamwork within and between the school staff, the families, and community are described and practiced through discussion, problem-solving activities, and role playing. Family effectiveness assessment instruments and strategies are also described and practiced.
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDC 445  Develop Assess of Young Child   3 Credit Hours
Survey and demonstrations of formal and informal measures to assess young children's physical, social, intellectual, and emotional development. Instruction in some techniques appropriate for use by classroom teachers, childcare directors, health care professionals, and others who are interested in assessing the development of children aged birth to nine years. For graduate credit elect EDC 545. (AY)
Prerequisite(s): EDC 240 or EDC 340
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDC 446  Cog/Memory Dev in Children   3 Credit Hours
Examines the theories and recent research on the development of cognition and memory. Selected topics include: perception, language, representation, social cognition and problem solving. Educational implications and strategies for developing children's thinking and memory are explored.
Prerequisite(s): EDC 240 or EDC 340
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

EDC 454  Formal & Informal Testing&Eval   2 to 3 Credit Hours
In this course students will develop their knowledge and skills in traditional and non-traditional methods for evaluating classroom learning, performance technology and training. Students will learn how to construct evaluations, tests, analyze evaluation results, conduct program evaluation and educational assessment in relation to performance technology, training, and teaching and learning. (OC)
Restriction(s):
Can enroll if Class is Junior or Senior

EDC 455  Assmt: Sec Lang Learning K-12   2 Credit Hours
In this course students will learn to identify, assess, and place second language learners for appropriate instruction and instructional programs. Students will review, evaluate, and implement a variety of assessments and strategies intended for use with limited English proficient students, K-12. Students will also examine the impact and issues regarding high-stakes assessments on English language learners. Official admission to and good standing in the teacher certification program are required. (W).
Prerequisite(s): EDD 447 and EDD 448
Restriction(s):
Can enroll if Class is Junior or Senior

EDC 456  Learning & Classrm Assessment   3 Credit Hours
In this course students will examine the relationship between curriculum, instruction and assessment. Students will review different forms of assessment and evaluate the strengths and weaknesses of each format. Students gain experience in 1) selection of assessment formats based on curricular focus and student developmental levels; 2) development of assessments; 3) decision-making based on the results of the assessments. (YR)

EDC 460  Educating the Exceptional Chld   3 Credit Hours
Characteristics, identification, assessment, and instruction of students with exceptionalities are addressed. Includes students with learning disabilities, behavior disorders, emotional impairment, mild mental retardation, communicative disorders, visual and hearing impairments, orthopedic impairments, giftedness, and chronic medical conditions. Service delivery models, general assessment procedures, and curricular and instructional adaptations that help integrate students with exceptionalities into the general education classroom will also be addressed.
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

EDC 471  Prog Impl, Super, & Management   3 Credit Hours
Full Title: Program Implementation, Supervision & Management This course seeks to address the selection, development, and integration of behavior change procedures within the context of the BACB's Compliance Code and Disciplinary Systems, and strategies for personnel training, supervision and management. Through the use of case studies, students will develop behavioral programming, consider the ethical guidelines necessary for the development and execution of programming, consider the personnel issues to consider for effective programming, and examine strategies that allow for more effective personnel training, monitoring, and supervision. (YR)
Prerequisite(s): EDC 306
EDC 476  Literacy Assessmt for Instr  4 Credit Hours
Topics include various diagnostic tools for reading, writing, speaking, and listening. Students will learn to implement a variety of diagnostic techniques for assessing literacy for instructional purposes and communication with parents, other professionals, and paraprofessionals about student progress.
Prerequisite(s): EDD 468 and (EDD 419 or EDA 419)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDC 480  Behavioral Assessment  3 Credit Hours
This course will focus on Functional Behavior Assessment, a process used in the field of Applied Behavior Analysis (ABA) that uses a variety of techniques and strategies to gather information that allow practitioners to identify the function, or purpose, of behavior. Essential elements of the Functional Behavior Assessment/Functional Analysis process will be addressed with emphasis on the interrelationship between the assessment results and the development of interventions based upon the principles of ABA. (YR)
Prerequisite(s): EDC 306 and EDC 307

EDC 490  Litrcy Instr & Assess for Els  3 Credit Hours
Full Title: Literacy Instruction and Assessment for English Language Learners The course covers current and research-based pedagogy for literacy instruction and assessment for teaching English language learners. This course provides the knowledge and skills to effectively teach literacy to non-native speakers of English. (YR)
Restriction(s):
Cannot enroll if Class is Freshman

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

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* An asterisk denotes that a course may be taken concurrently.

EDD 301  Directed Teach in Second Schls  6 to 12 Credit Hours
Directed teaching consists of a teaching internship in a selected classroom for a full term under the direction of an experienced teacher. Includes a brief period of observation followed by several weeks of responsible teaching including the writing, implementing, and evaluation of lesson plans using University-approved practices. Official admission and good standing in the certification program are required. Methods courses in the major and minor and valid TB clearance required.
Prerequisite(s): EDC 300 and EDC 301 and EDC 302 and EDA 340 and EDC 460 and EDD 469
Corequisite(s): EDD 304
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior

EDD 304  Seminar: Teach Secondary Grds  1 to 2 Credit Hours
Draws upon the resources found in the directed teaching environment. Considers problems and issues in four broad areas: students in the school, the teacher’s professional responsibilities, curriculum understandings, and administrative/organizational problems. Open only to students enrolled in EDD 301.
Corequisite(s): EDD 301
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only

EDD 305  Direct Teach in Elem School  6 to 12 Credit Hours
Directed teaching consists of a teaching internship in a selected classroom for a full term under the direction of an experienced teacher. Includes a period of brief observation followed by several weeks of responsible teaching including the writing, implementing, and evaluation of lesson plans using University-approved practices. Official admission to and good standing in certification program as well as valid TB clearance are required.
Prerequisite(s): EDC 300 and EDC 301 and (EDC 340 or EDC 240) and EDC 460 and EDC 452 and EDD 467 and EDD 468 and EDD 471 and EDD 485 and EDD 495 and EDF 450
Corequisite(s): EDD 307
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior or Graduate
Can enroll if College is Education, Health, and Human Services

EDD 307  Seminar: Teaching Elem Grades  1 to 2 Credit Hours
Draws upon experience in elementary directed teaching. Considers pupils in the school, classroom environment, teaching competencies, professional responsibilities, school curriculum and policies, and administrative/organizational problems. Open only to students enrolled in EDD 305.
Corequisite(s): EDD 305
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior
Can enroll if College is Education, Health, and Human Services
EDD 404  Inquiry Based Curr Prim Grades  3 Credit Hours
This course examines how teachers can apply inquiry method to all curriculum areas in the primary grades. Major focus will be designing curriculum to meet state and professional guidelines within a developmentally appropriate context.
Prerequisite(s): (EDC 340 and EDC 341) or (EDC 240 and EDC 241) and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 410
Restriction(s):
Can enroll if Class is Junior or Senior

EDD 406  Teach Strategies Early Child  3 Credit Hours
Focuses on the developmentally appropriate educational practices for children from infancy through the primary grades. Introduces various procedures and strategies to stimulate inquiry in the early childhood classroom. Observation skills, planning, and implementing of lessons in the field will be emphasized. Class seminar designed to correlate theory with observation and field work.
Prerequisite(s): (EDC 240 or EDC 340) and (EDC 341 or EDC 241) and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 410
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate

EDD 407  Workshop: Global Ed Soc Stds  1 to 3 Credit Hours
A course designed to help elementary and secondary teachers develop strategies that will help them to teach about an interdependent and changing world. Concepts such as change, the culture, and interdependence will be introduced and examined in terms of implementation within the framework of the existing social studies curricula.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 110 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate

EDD 410  Practicum in Early Child Ed  1 Credit Hour
A supervised field experience related to the study of early childhood education. Requires a minimum of 45 clock hours of observation and work spread over a semester in an early childhood school setting. Must be taken concurrently with EDD 406. (F.W).
Prerequisite(s): Phase II ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 406
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate

EDD 411  Directed Tchg: Early Childhood  3 or 4 Credit Hours
Supervised observation and teaching in early childhood programs under the joint direction of university and school personnel. Open only to students in the Early Childhood Education program or Children and Families Program who have been approved by the program director. Must be elected concurrently with EDD 412. TB clearance, FIA clearance, criminal background check, and physician's statement of good health are required.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and EDD 406 and EDD 410
Corequisite(s): EDD 412
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate

EDD 412  Seminar in Early Childhood Ed  2 Credit Hours
Focuses on developmentally appropriate educational practices for children in early childhood programs. With an emphasis on writing developmentally appropriate lesson plans, the Reggio Emilia Inspired Approach, assessment of young children, classroom and staff management, multiculturalism, family centered approaches, children with special needs and professional development. The seminar provides a theoretical foundation for the field placement (D411, D418 and D494). Open only to students in Early Childhood or Children and Families program who have been approved by the program director. TB clearance and physician's statement of good health required. EDD 406 and 410 are required for undergraduates.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and EDD 406 and EDD 410
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate

EDD 413  LD Elem Directed Teaching  2 Credit Hours
Field experience with elementary students with learning disabilities in general and special education classrooms. Experiences include delivery of direct instruction through observation, tutoring, small and large group instruction, curriculum development and adaptations, participation in the IEP and ITP process, collaboration and co-teaching with regular classroom teachers in various academic content areas, and other activities under the joint direction of university and school personnel. Open only to students in the Early Childhood Education program or Children and Families Program who have been approved by the program director. Students must complete EDC 401, EDC 401, EDN 403, EDN 404, and EDN 402 prior to registering for this LD directed teaching.
Corequisite(s): EDD 420, EDN 408
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services
Can enroll if Major is Special Education
EDD 416 Creativity/Crit Thnk Yng Childr  3 Credit Hours
This course intends to study the processes and products of creativity for both adults and young children. Strategies for promoting the emerging creative disposition of the young child, birth to eight years, will be explored. Areas of focus will include art, music, movement, dramatic play, improvisation, storytelling, and problem-solving. The importance of understanding and encouraging the young child's capacity for representation skills will be emphasized.
Prerequisite(s): EDC 340 and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

EDD 417 Wrkshp: Biling/Bicult Pupils  1 to 4 Credit Hours
The course will focus on developing a) an understanding of bilingual and bicultural pupils by examining their ethnic and racial backgrounds in terms of their values and institutions and how these affect their adjustment in the school and community environments, and b) effective learning strategies, techniques, and materials to use in various content areas.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Junior or Graduate

EDD 418 Children and Families Intern  4 Credit Hours
Supervised observation and teaching in an Early Childhood classroom setting, or parent education program in a Family Service Agency under the joint direction of University and school or Agency personnel. Open only to students in the Children and Families program who have been approved for the course by the program director. Must be elected concurrently with EDD 412. TB clearance, FIA clearance, criminal background check, blood borne pathogen, video record consent, and physician's statement of good health required.
Prerequisite(s): EDD 411 and EDD 412 and Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 419 Early Literacy/Language Develp  3 Credit Hours
This course examines early language development, the factors that contribute to its growth and the role that it plays in the development of literacy. Diagnostic techniques for assessing language and literacy and teaching strategies and materials to facilitate language and literacy growth in children birth through third grade will be discussed. (YR)
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Reading with a score of P and MTTC Basic Math with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270) and EDA 340
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Education, Health, and Human Services
Can enroll if Program is

EDD 420 LD Sec Directed Teaching  2 Credit Hours
Field experience with elementary students with learning disabilities in general and special education classrooms. Experiences include delivery of direct instruction through observation, tutoring, small and large group instruction, curriculum development and adaptations, participation in the IEP and ITP process, collaboration and co-teaching with regular classroom teachers in various academic content areas, and other activities under the on-site supervision of a certified teacher of LD and LD certified University field supervisor. Students must complete EDC 401, EDN 41, EDN 403, EDN 404, and EDN 402 prior to registering for their LD directed teaching.
Corequisite(s): EDN 408, EDN 413
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior
Can enroll if Level is Undergraduate
Can enroll if Major is Special Education

EDD 421 Directed Teach Secondary Sch  6 to 12 Credit Hours
Directed teaching consists of a teaching internship in a selected classroom for a full term under the direction of an experienced teacher. Includes a brief period of observation followed by several weeks of responsible teaching including the writing, implementing, and evaluation of lesson plans using University-approved practices. Official admission and good standing in the College of Education, Health, and Human Services teacher certification program are required. Completion of methods courses in the major and minor and passing appropriate MTTC tests required. Students cannot receive credit for both EDD 421 and EDD 301.
Prerequisite(s): EDC 300 and EDC 301 and (PSYC 407 or EDC 302) and EDC 460
Corequisite(s): EDD 424
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

EDD 424 Sem: Teaching Secondary Grds  1 Credit Hour
This course draws upon the resources found in the directed teaching environment. Students will consider problems and issues in four broad areas: students in the school, the teacher's professional responsibilities, curriculum understandings, and administrative/organizational problems. Open only to students enrolled in EDD 421.
Corequisite(s): EDD 421
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services
EDD 427 Workshop: Art in Elem School  2 Credit Hours
A course which presents the rationale, trends, and principles of art education for elementary teachers. Teachers will have ample opportunities to experiment with various art media such as printmaking, puppetry, paints, and clay. Different strategies that focus on the creative growth of children will be developed.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

EDD 429 Tch Cntrv Iss at Elem/Sec Lvl  2 to 3 Credit Hours
This course is designed to provide the classroom teacher with the rationale, various approaches, and strategies and techniques to use in teaching controversial issues at the elementary and secondary levels.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

EDD 435 Dir Teaching: Elementary Sch  6 to 12 Credit Hours
Directed teaching consists of a teaching internship in a selected classroom for a full term under the direction of an experienced teacher. Includes a brief period of observation followed by several weeks of responsible teaching including the writing, implementing, and evaluation of lesson plans using University-approved practices. Official admission and good standing in the College of Education, Health, and Human Services teacher certification program are required. Completion of methods courses in the major and minor and passing appropriate MTTC tests required. Student may not receive credit for both EDD 435 and EDD 305.
Corequisite(s): EDD 437
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

EDD 437 Sem: Teaching Elementary Grds  1 Credit Hour
This course draws upon the resources found in the directed teaching environment. Students will consider problems and issues in four broad areas: students in the school, the teacher’s professional responsibilities, curriculum understandings, and administrative/organizational problems. Open only to students enrolled in EDD 435.
Corequisite(s): EDD 435
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Senior
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

EDD 440 Teach English in Second Grds  2 to 3 Credit Hours
Investigates the general and specific goals and objectives of English education. Trends, materials, and strategies are presented. A study of outstanding problems in the teaching of English composition, literature, grammar, and language are discussed. Official admission to and good standing in teacher certification program are required. EDD 441 required concurrently for undergraduate only.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 441
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 441 Practicum: English Second Grd  1 Credit Hour
A supervised field experience related to the study of English in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Official admission to and good standing in the teacher certification program are required. Must be taken concurrently with EDD 440. For graduate credit elect EDD 502.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 440
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior or Graduate

EDD 442 Differentiating Inst K-12 Clrm  2 to 3 Credit Hours
Individualized instruction combined with the latest information on the brain and our understanding of multiple intelligences leads us to a new method of meeting the needs of students called differentiating instruction. This course will look at the concept of differentiating instruction in-depth. (OC).
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if Level is Undergraduate

EDD 443 Tchg Writ at the Secondary Lvl  2 to 3 Credit Hours
This course is designed to help the classroom teacher promote functional and creative writing among students at the secondary school level. Attention will be given to both theory and research with emphasis on the development of instructional strategies, teaching materials and practical resources. (OC)
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Junior or Senior
Can enroll if College is Education, Health, and Human Services
EDD 445  New Mthds,Strat/Mat Soc Stud  2 Credit Hours  
Examines new developments in methodology in relation to learning theory. Investigates systems for evaluating curricular materials. Explores experimental programs, new courses of study, multimedia approaches and current research in the social studies. (OC).

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

EDD 446  Intervention Strat EC Spec Ed  3 Credit Hours  
Strategies and methods which early educators can use when planning and implementing interventions for infants, toddlers and young children with disabilities and their families. Emphasis will be on addressing family identified priorities and the goals and objectives stated on the Individual Family Service Plan (IFSP) or Individual Educational Plan (IEP) using activity-based intervention, adapting materials, modifying environments and using assistive technology. (W, YR).

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and EDC 414 and (EDC 340 or EDC 240)

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDD 447  Tchng English as Second Lang  3 Credit Hours  
This course examines current methodologies and theories for English as a second language learning and instruction. Emphasis will be placed on a standards-based curriculum for English language learners. The use of communicative activities and strategies for developing English language skills in the elementary grades will be emphasized. Official admission to and good standing in a teacher certification program are required.

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Corequisite(s): EDD 448

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 448  Pract: Tchng Enlg Secnd Lang  1 Credit Hour  
A supervised field experience related to the teaching of English as a second language. Required a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Official admission to and good standing in the teacher certification program are required. Must be taken concurrently with EDD 447. For graduate credit elect EDD 548.

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Corequisite(s): EDD 447

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 450  Teach Math in Second Grades  3 Credit Hours  
This course discusses: 1) the more important parts of recent pedagogical literature, 2) new instructional materials, methods, and curricular trends, and 3) procedures useful in the construction of new units and in the improvement of curricular units. Official admission to and good standing in a teacher certification program are required. EDD 451 required concurrently for undergraduates only. For graduate credit elect EDD 565.

Prerequisite(s): MATH 331 and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and (Composition Placement Score with a score of 40 or COMP 105 or COMP 110 or COMP 280 or COMP 270)

Corequisite(s): EDD 451

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 451  Practicum: Math Second School  1 Credit Hour  
A supervised field experience related to the teaching of mathematics in grades 6-12. Requires a minimum of 45 clock hours of observation and work over a semester in a school setting. Official admission to and good standing in the teacher certification program are required. Must be taken concurrently with EDD 450. For graduate credit elect EDD 566.

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Corequisite(s): EDD 450

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior or Graduate

EDD 452  Methods of Teaching Math K-8  3 Credit Hours  
The course relates to the teaching of the mathematics curriculum in the elementary and middle school. The emphasis is on the development of teaching techniques that promote problem solving, reasoning, connections, communication, and concept and algorithmic development. Cooperative groups, manipulatives, technology, and alternative assessment will be explored as tools for meeting the special needs of every child in grades K-8. Required of all preservice elementary teachers. Official admission to and good standing in teacher certification program required. The course includes a field experience in an assigned school setting.

Prerequisite(s): MATH 387 and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 454  Wrkshp: Newspaper in Education  2 Credit Hours  
A course designed to familiarize elementary and secondary teachers with the use of newspapers as a classroom resource. Workshop participants will use the daily newspaper and other resource materials to develop activities appropriate for meeting their own professional needs. Emphasis will be on the enhancement of academic skills, practical life skills and creative expression. (OC)

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)

Restriction(s):
Can enroll if Class is Junior or Senior
EDD 463  Tchg Gifted Stdnt Reglr Classr  2 Credit Hours
This course introduces classroom teachers to the education of gifted and talented students in the regular classroom. It is designed to help teachers understand the social, emotional, and intellectual needs of gifted students and to show them ways of effectively addressing these needs along with those of the other students present. It will offer specific proposals for structuring the learning environment as well as for selecting appropriate levels and types of subject matter. (OC).

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate

EDD 466  Tchg Coll Sci: Clsrm Dynamics  3 Credit Hours
A seminar analyzing current methods of college science teaching. Students will be paired with a senior faculty mentor and participate in the planning and teaching of introductory courses. Recommended for advanced undergraduates planning to attend graduate school and/or those interested in teaching. Written permission of instructor required. (OC).

Prerequisite(s): (NSCI 390 or EDD 390) and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)

EDD 467  Practicum in Reading Instruct  1 Credit Hour
A supervised field experience related to the teaching of reading in grades K-8. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Official admission to and good standing in teacher certification program required. Must be taken concurrently with EDD 471.

Prerequisite(s): EDD 468 and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate

EDD 468  Teach Read/Lang Arts- Elem Grd  3 Credit Hours
Acquaints the student with theory, methods, materials, and research related to the teaching of reading and other communications skills in the elementary school. Includes classroom activities designed to strengthen skills in reading comprehension, content area reading, word attack, and the related language arts. Official admission to and good standing in the College of Education, Health, and Human Services teacher certification program are required.

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate

EDD 469  Reading in the Content Areas  3 Credit Hours
Emphasis on developmental and remedial reading activities at the middle grades and the secondary level: diagnosis, testing, and materials; reading in the content subjects; study habits; independent reading activity; exemplary programs. Some attention will be given to related problems in the teaching of written composition. Official admission to and good standing in the College of Education, Health, and Human Services teacher certification program are required. For graduate credit, elect EDD 569.

Prerequisite(s): (COMP 106 or COMP 220 or COMP 280 or COMP 270)

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate

EDD 471  Reading Instr: Models and Meth  3 Credit Hours
Various approaches to reading instruction are required. The teaching of reading/study skills in content areas and an introduction to different forms of testing will be addressed. Students will be required to complete a reading tutorial in meeting the needs of an elementary student.

Not open to students who have taken EDD 472, EDD 532, or EDD 570. Official admission to and good standing in SOE certification program are required.

Prerequisite(s): EDD 468 and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Corequisite(s): EDD 467

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate

EDD 474  Environmental Education  2 to 3 Credit Hours
An analysis of environmental education at both the elementary and secondary school level particularly stressing the environment as a teaching resource. Community resources as they relate to environmental education also are investigated.

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate

EDD 480  Teach of Sci in the Second Grd  2 to 3 Credit Hours
A survey of the place of science in the secondary school curriculum, an analysis and evaluation of objectives, and a consideration of modern practices in teaching science. Official admission to and good standing in teacher certification program are required.

Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75

Corequisite(s): EDD 481

Restriction(s):
Can enroll if Class is Undergraduate
Can enroll if Level is Undergraduate
EDD 481  Practicum in Science:Second Grd  1 Credit Hour
A supervised field experience related to the teaching of science in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Official admission to and good standing in teacher certification program are required. Must be taken concurrently with EDD 480. For graduate credit elect EDD 581.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 480
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 482  Teach of Sci in Second Grd II  3 Credit Hours
This course builds upon the concepts and skills developed in EDD 480 as students learn to become effective, reflective science teachers. Students will learn multiple strategies for effective lesson planning, teaching, and assessment in science. Science, technology, engineering and mathematics (STEM) and integration of reading/writing strategies will be emphasized throughout the course. Students cannot receive credit for both EDD 482 and EDD 582. Students seeking graduate credit should enroll in EDD 582.
Prerequisite(s): EDD 480 and EDD 481
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

EDD 483  Wkshp:Sci Teach Elem/Midd Schl  1 to 3 Credit Hours
Deals with existing and innovative science materials. Offered at various times emphasizing one or more areas from elementary and middle level science. Centers on a laboratory approach. May be elected twice for a total of six credits. (OC).
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

EDD 485  Teach Science in the Elem Grd  2 to 3 Credit Hours
Explores the objectives, methods, and instructional emphasis of elementary school science. Stresses concept development in several areas of elementary science. Provides opportunity for preparation of materials for classroom use. Official admission to and good standing in teacher certification program are required. For graduate credit, elect EDD 585.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 486  Environmental Interpretation  3 Credit Hours
Course deals with the interpretation of the environment, its characteristics, and its presentation to school groups as well as to the general public. Intended to acquaint students with a variety of skills and techniques necessary for interpreting the environment to others. Extensive use is made of the UM-D Environmental Study Area.
Restriction(s):
Can enroll if Class is Junior or Graduate

EDD 489  Practicum in Soc Stud:Sec Sch  1 Credit Hour
A supervised field experience in a selected middle or high school social studies classroom. The course requires a minimum of 45 hours of observation of an experienced teacher as well as the writing, implementation, and assessment of one or more lessons. Official admissions to and good standing in the teacher certification program in required.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 490
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 490  Tch of the Soc Stud in Sec Sch  2 to 3 Credit Hours
This course examines theoretical and practical approaches to teaching social studies at the secondary level. Students explore, develop, and evaluate instructional methods. In light of professional standards, they consider diverse strategies for teaching and assessing middle and high school students.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 489
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 491  Soc Elem Grades Practicum  1 Credit Hour
A supervised field experience related to the methods and strategies associated with the teaching of social studies in grades K-5. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Must be taken concurrently with EDD 495. Official admission to and good standing in teacher certification program required.
Prerequisite(s): EXPS 282 and EXPS 283 and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Corequisite(s): EDD 495
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDD 493  Simulation and Gaming  1 to 3 Credit Hours
This course focuses on simulation and gaming as approaches to learning which are fundamentally different from methods traditionally used in education, industry, business, and psychology. Students will have the opportunity to examine many different types of simulations and games and to participate in selected ones. They will also be able to design one for use in their own area of interest.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
EDD 495  Social Studies in the Elem Grd  2 to 3 Credit Hours
Examination and analysis of various programs and materials currently available for teaching social studies at the elementary level. Critical investigation of new developments and trends. Opportunity is provided to experiment with various techniques and to evaluate their effectiveness. Official admission to and good standing in teacher certification program are required.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 496  Second Lang Tchg: Sec Level  3 Credit Hours
An examination of current methodologies and techniques for instruction in foreign languages in grades 7-12. Emphasis will be placed on a standards-based curriculum with special attention given to the creation of learning scenarios. The use of communicative activities and the assessment of language skill areas will also be emphasized. Official admission to and good standing in teacher certification program are required.
Prerequisite(s): (FREN 301 or GER 301 or SPAN 301) and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 105 or COMP 270 or COMP 280 or COMP 110)
Corequisite(s): EDD 497
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 497  Second Lang Tchg: Sec Level  1 Credit Hour
A required supervised field experience related to the teaching of a foreign language in grades 7-12. Involves a minimum of 45 clock hours of work and observation spread over one semester in a supervised classroom setting. Methods and techniques learned in EDD 496 will be used to increase the second language proficiency of learners in grades 7-12. Official admission to and good standing in teacher certification program are required. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent).
Prerequisite(s): (FREN 301 or GER 301 or SPAN 301) and Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1
Corequisite(s): EDD 496
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

EDD 498  Writing Meth: Formal&Informal  3 Credit Hours
This course is designed for those wishing to establish or improve creative writing programs in their elementary school classrooms. Theoretical models will be discussed. Strategies and materials that facilitate the writing of prose and poetry will be emphasized.
Prerequisite(s): Phase III ED Students with a score of 1 and Minimum GPA with a score of 2.75 and MTTC Basic Math with a score of P and MTTC Basic Reading with a score of P and MTTC Basic Writing with a score of P and (Composition Placement Score with a score of 40 or COMP 106 or COMP 220 or COMP 280 or COMP 270)
Restriction(s):
Can enroll if Class is Junior or Graduate

Other Content
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Edu F-Physical Education (EDF)

EDF 270  Physical Activity and Health  2 to 3 Credit Hours
Discussion of topics related to attaining a healthy lifestyle including nutrition, stress management techniques, physical training programs, cardiovascular disease, risk factors and other health-related topics.

EDF 450  Hlth, Nutr, & PE/Clsrm Tchrs  2 Credit Hours
Instruction and participation in health, nutrition and physical education concepts and principles as they relate to elementary school curriculum. The six-dimensional model of wellness will be applied to meet legislative goals and objectives for the various grade levels. Required for elementary education majors.
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

EDF 455  Principles of Coaching  2 Credit Hours
Instruction in the basic principles and psychology of coaching all age groups, skill levels and genders. Emphasis will be placed on many factors which relate to success in athletic/sports, the qualities and qualifications of coaches, and the administration of programs and organized practices.
For graduate credit, elect EDF 555. (OC).
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior

Other Content
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
**Educ K-Independent Study (EDK)**

**EDK 380  Undergraduate Reading Research  1 to 2 Credit Hours**
Permits qualified students to pursue a program of reading under the direction of a staff member selected by the student. The faculty member must agree to serve prior to the course election. May be elected twice for a total of two hours credit.

**EDK 480  Independent Action Research  1 to 4 Credit Hours**
Requires the student to initiate and pursue to completion an informal field-based research study under faculty supervision. The faculty member must agree to supervise prior to course election. May be elected twice for a total of two hours credit.

**EDK 490  Education Internship  1 to 10 Credit Hours**
This internship provides the student with opportunity for supervised, non-classroom experience in a school, college, or other educational setting. Between eight and forty clock hours of unpaid work per week, in conjunction with an arranged seminar, are required. The course may be elected twice for a total of four to ten semester credit hours.

Other Content

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:

- (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

**Educ M-Community & Bilingual (EDM)**

**EDM 405  TESOL Strategies for Classroom  3 Credit Hours**
This course examines instructional strategies and assessment for teaching English to speakers of other languages (TESOL). These strategies are intended for students who are learning English as a foreign language. This course is specifically designed for individuals planning on teaching English to children and adults in non-English speaking communities abroad.

**Restriction(s):**
Can enroll if Class is Junior

**EDM 4100  Teach Eng Specific Purposes  3 Credit Hours**
Full Course Title: Teaching English for Specific Purposes This course is designed to provide the knowledge and skills to teach adult speakers of other languages to use English for specific purposes. These are students who will already have a working knowledge of English, but need to have more specialized language for professional, academic and/or job-related skills. (YR)

Other Content

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:

- (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Educ N-Special Education (EDN)**

**EDN 227  Inclusion: Multisens/Direct Inst  2 to 3 Credit Hours**
Course addresses developing, implementing, and evaluating teaching strategies and materials that incorporate principles of direct instruction and multi-sensory activities that promote inclusion of students with special needs in general education settings, increase all students’ academic achievement, and improve social interaction among students from a wide variety of social, economic, and cultural backgrounds. (F,W,S).

**Restriction(s):**
Can enroll if Class is Undergraduate NCFD or Freshman or Sophomore or Junior or Senior

**EDN 401  Strategies for LD  3 Credit Hours**
Course addresses developing, implementing, and evaluating teaching strategies and materials that address the needs of students with learning disabilities in special and regular education classes. Course addresses diagnostic-prescriptive teaching, direct instruction, and specific strategies and materials addressing each academic area. The Individualized Education Program (IEP), development of goals and objectives, linking assessment with instruction, inclusion, and generality of behavior change will also be included.

**Prerequisite(s):** EDC 401

**Restriction(s):**
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services

**EDN 402  Socio-vocational Transitions  3 Credit Hours**
This course includes strategies that teach age-appropriate social skills to students with disabilities in a variety of social settings found in the school, home and community. This course will also focus on issues relevant to vocational and community transitions for students with disabilities. As opposed to rote learning of material the course intends to provide students with a conceptual understanding of issues related to social and vocational transitions.

**Restriction(s):**
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services
EDN 403 Assessment of the Learner 3 Credit Hours
Formal and informal assessment strategies used in the identification and service of students with handicaps are described. Technical and operational aspects of standardized testing, curriculum based assessment, and informal strategies are described.
Prerequisite(s): EDC 401
Corequisite(s): EDN 404
Restriction(s):
Can enroll if Class is Post-baccalaureate NCDF or Post-baccalaureate Cert only or Junior or Senior
EDN 404 Assessment Practicum 1 Credit Hour
Clinical experiences with formal and informal assessment strategies currently used by special educators to identify and program for students with handicaps. Activities include administration, scoring and interpretation of norm- and criterion-referenced tests, Curriculum Based Assessments and informal assessment strategies. Deriving goals, objectives, activities and strategies from assessment data are also included. Must be taken with EDN 403 for the LD endorsement. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent).
Prerequisite(s): EDC 401 and Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1
Corequisite(s): EDN 403
Restriction(s):
Can enroll if Class is Post-baccalaureate NCDF or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services
EDN 406 Collaboration in the Classroom 3 Credit Hours
Techniques for enhancing collaboration between special and regular classroom teachers of mainstreamed exceptional and low-achieving learners at all levels. Included are essential skills for managing and monitoring the learning process and maintaining collaborative partnerships. As opposed to rote learning of material, the course will provide students with a conceptual and practical understanding of issues relevant to collaboration.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Post-baccalaureate NCDF or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services
EDN 408 LD Directed Teaching Seminar 2 Credit Hours
Seminar will focus on the discussion, development, and evaluation of Individualized Educational Programs, Individualized Transition Plans, and Behavior Intervention Plans for students with learning disabilities at a variety of directed teaching sites. Topics will include academic and behavior assessment and strategies, curriculum, child study teaming, service delivery options and inclusion strategies. Co-requisite: EDD 420
and EDD 413. Students must complete EDC 401, EDN 401, EDC 403, EDN 404 and EDN 402 prior to registering for their LD directed teaching.
Corequisite(s): EDD 413
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is Special Education
EDN 410 Intro to Cognitive Impair I 3 Credit Hours
Historical perspectives, definition, terminology, and assessment of the full spectrum of cognitive impairments are addressed. Identification of the behavioral, social, intellectual, communicative, vocational, adaptive, psychological, and educational/instructional needs of individuals with mild cognitive impairments across the lifespan.
Prerequisite(s): EDC 460
Corequisite(s): EDN 411
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services
EDN 411 Cognitive Impair Pract I 1 Credit Hour
Experience in an educational setting with students with mild cognitive impairments for no less than 45 clock hours. Activities include working with the cooperating teacher on tasks such as individual instruction, data collection, informal assessment and program implementation and evaluation of IEP goals and objectives.
Prerequisite(s): EDC 460
Corequisite(s): EDN 410
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services
EDN 412 Intro to Cognitive Impair II 3 Credit Hours
This course is an extension of introduction to Cognitive Impairments I. Identification of the behavioral, social, intellectual, communicative, vocational, adaptive, psychological and educational/instructional needs of individuals with moderate and severe cognitive impairments across the lifespan.
Prerequisite(s): EDC 460 and EDN 401 and EDN 411
Corequisite(s): EDN 413
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services
EDN 413 Cognitive Impair Pract II 1 Credit Hour
Experience in an educational setting with students with moderate and severe cognitive impairments for no less than 45 clock hours. Activities include working with the cooperating teacher on tasks such as individual instruction, data collection, informal assessment and program implementation and evaluation of IEP goals and objectives.
Prerequisite(s): EDC 460 and EDN 410 and EDN 411
Corequisite(s): EDN 412
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services
EDN 414 Assessment Cognitive Impair 3 Credit Hours
Course discusses different theories of intelligence and intellectual development. Students learn to identify and describe different instruments used to assess the intellectual, adaptive behavior, academic, language/communication, vocational and social needs of students with mild, moderate and severe cognitive impairments.
Prerequisite(s): EDC 460 and EDN 410 and EDN 411 or EDN 412 and EDN 413
Corequisite(s): EDN 415
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDN 415 Assessment Pract Cogn Impair 1 Credit Hour
Clinical experience with formal and informal assessment strategies currently used by special educators to identify needs and develop programming for students with mild, moderate and severe cognitive impairments. Activities include practicing observational techniques, completing, analyzing and interpreting various formal and informal assessments, including norm referenced and criterion referenced tests, achievement tests, rating scales and checklists.
Prerequisite(s): EDC 460 and EDN 410 and EDN 411 and EDN 412 and EDN 413
Corequisite(s): EDN 414
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDN 416 Strategies Cognitive Impair I 3 Credit Hours
Course content includes strategies for teaching students with mild cognitive impairments. Strategies for effective teaching and the development of instructional materials and learning environments for students with mild cognitive impairments is addressed. Functional academics, positive behavior supports, community based instructional support, self-determination, the use of instructional technology and supports, communication skills, adaptive behavior skills are covered within the context of the IEP, development of goals and objectives linking assessment with instruction, designing effective learning environments and integrating students with moderate and severe cognitive impairments into the least restrictive environment.
Prerequisite(s): EDC 460 and EDN 410 and EDN 411 and EDN 414 and EDN 415
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDN 417 Strategies Cognitive Impair II 3 Credit Hours
Course content includes strategies for teaching students with moderate and severe cognitive impairments. Strategies for effective teaching and the development of instructional materials and learning environments for students with moderate and severe cognitive impairments are included. Functional academics, positive behavior supports, community based instructional support, self-determination, the use of instructional technology and supports, communication skills, adaptive behavior skills are covered within the context of the IEP, development of goals and objectives linking assessment with instruction, designing effective learning environments and integrating students with moderate and severe cognitive impairments into the least restrictive environment.
Prerequisite(s): EDC 460 and EDN 412 and EDN 413 and EDN 414 and EDN 415
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDN 418 Dir Teach I: Mild CI 2 Credit Hours
Field experience with students with mild cognitive impairments in classroom settings. Experiences include the delivery of direct instruction in functional academic, community based skills, functional living skills, and communication skills. Academic and behavioral assessments leading to the development and implementation of IEPs and BIPs are included. Students will also engage in observations, small and large group instruction, curriculum development, program development and implementation and participation in the EIP process. Collaboration with other classroom teachers in general and special education settings, and other activities under the on-site supervision of a certified CI teacher and university field supervisor. Directed teaching also includes weekly seminar.
Prerequisite(s): EDC 460 and EDN 410 and EDN 411 and EDN 414 and EDN 415 and EDN 416
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDN 419 Dir teach II: Mod/Sev CI 2 Credit Hours
Field experience with students with moderate and severe cognitive impairments in classroom settings. Experiences include the delivery of direct instruction in functional academic, community based skills, functional living skills, and communication skills. Academic and behavioral assessments leading to the development and implementation of IEPs and BIPs are included. Students will also engage in observations, small and large group instruction, curriculum development, program development and implementation and participation in the EIP process. Collaboration with other classroom teachers in general and special education settings, and other activities under the on-site supervision of a certified CI teacher and university field supervisor. Directed teaching also includes weekly seminar.
Prerequisite(s): EDC 460 and EDN 410 and EDN 411 and EDN 414 and EDN 415 and EDN 417
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services
EDN 420  Intro to Emotional Impairments  3 Credit Hours
Identification of the behavioral characteristics and instructional needs of children with emotional impairments/behavior disorders. Causes of emotional impairments and environmental influences as well as strategies for identification, assessment and interpreting such instruments will be addressed. Finally, instructional strategies for students with emotional impairments will be described and practiced through classroom activities.
Corequisite(s): EDN 421
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDN 421  Practicum at Psych Facility  1 Credit Hour
Experience in a clinical setting with emotionally impaired individuals, for no less than 45 clock hours. Activities include working with cooperating teacher on tasks such as individual tutoring, data collection, informal assessment, interpretation of psychological data, and program implementation and evaluation. Also included will be the development of individualized instructional strategies, classroom activities, the use of adaptive technology, interdisciplinary approaches and the development of relevant goals and objectives for emotionally impaired students.
Corequisite(s): EDN 420
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDN 423  Strat: Emotional Impairments  3 Credit Hours
Course content includes strategies for teaching students with emotional impairments, including instruction on reading and mathematics. Course also includes strategies to deal with hyperactive behavior, aggressive behavior, socially withdrawn behavior, and delinquency. Strategies for effective teaching and the development of instructional materials and learning environments for students with emotional impairments are included. The Individualized Education Program (IEP), development of goals and objectives, linking assessment with instruction, and integrating students with emotional impairments into the regular classroom will also be covered.
Prerequisite(s): EDN 320
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDN 425  Eco-Behavioral Assessment  3 Credit Hours
Formal and informal assessment strategies used in identifying and serving students with emotional impairments are described. Assessment strategies include eco-behavioral assessment, functional analyses, naturalistic observation techniques, norm-referenced and criterion-referenced tests, interviewing, achievement test, and curriculum based assessment. Technical aspects of assessment, interpretation of data, and diagnostic strategies are also addressed, as well as using adaptive technology and assessment instruments to facilitate more effective individualized instruction for students with emotional impairments. Finally, integrating assessment results from other disciplines will also be addressed.
Prerequisite(s): EDN 320
Corequisite(s): EDN 426
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDN 426  Eco-Behav Assessment Pract  1 Credit Hour
Clinical experiences with formal and informal assessment strategies currently used by special educators to identify and program for students with emotional impairments. Activities include practicing observation techniques, and completing and analyzing eco-behavioral assessments and functional analyses. Also included are administration, scoring, and interpretation of norm-referenced and criterion-referenced tests, curriculum based assessments, achievement tests, rating scales and checklists, and informal assessment strategies. Practicum activities will also focus on using assessment results in curriculum design and instructional strategies to meet the individualized instructional needs of EI students.
Prerequisite(s): EDN 320
Corequisite(s): EDN 425
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Junior or Senior
Can enroll if College is Education, Health, and Human Services

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Educ T-Education Technology (EDT)

EDT 210  Tech in Elementary Education  3 Credit Hours
Introduces students to the application of technology in elementary education. Students experience and become familiar with advanced learning technology tools; learn to use telecommunication tools for emailing, participating in educational listserv and online discussion groups, and accessing electronic resources on the WWW; learn to use productivity tools for word processing, drawing, painting and digital editing, spreadsheet application, database management, and multimedia presentation; learn to use educational multimedia for visual thinking, creativity, and multimedia authoring, learning to practice ethical and legal use of technology resources, and explore the use of such technology tools in the elementary classroom.

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services

EDT 211  Design Tech-Based Learn Solutn  3 Credit Hours
EDT 211 provides students with the opportunity to design and develop technology-based learning solutions for real-world instructional problems. Students will identify an instructional problem, collect data to assess relevant needs of an authentic population of learners and work collaboratively to create learning solutions for face-to-face, blended and/or online environments. Students will also become proficient in the operation of various pieces of hardware and software and develop skills for evaluating and integrating technology into the different learning environments.

EDT 401  Res, Trends,&Issues in Ed Tech  3 Credit Hours
This course is designed to acquaint the students with research and issues facing education in the digital era. This course will look at the wide range of developments in technology and investigate the trends that are impacting the field of educational technology. Students explore and analyze key issues related to technology in the classroom of the twenty-first century. (YR)

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDT 402  Survey of Educ Tech Tools  3 Credit Hours
This course provides students with a general overview of relevant educational software and hardware technologies as well as web-based digital resources that can be used in instructional settings. The students will learn how to identify, select, and integrate a broad range of technologies into different learning environments. Students will also create several technology-based instructional products using various tools, applications, and authoring environments. (YR)

Restriction(s):
Can enroll if Class is Professional Development or Junior or Senior
Can enroll if College is Education, Health, and Human Services or Arts, Sciences, and Letters

EDT 410  Teaching with Technology  3 Credit Hours
Introduces students to the management and integration of technology in education. Students experience and become familiar with technologically based teaching and learning materials; learn methodologies for using technology in specific teaching situations including audiovisual and media methods; develop skills in effectively evaluating educational software; explore how technology can be used as a problem-solving tool within the classroom environment; and become familiar with application programs, telecommunications and multimedia. Students also log a minimum of 45 hours of practicum experience in an instructional capacity where they have the opportunity to implement a variety of technology-enhanced learning activities that they create (F,W,S)
Prerequisite(s): EDT 210 or EDT 211

EDT 414  Application of Instrl Design  3 Credit Hours
The course provides students with necessary skills to apply Technological Pedagogical Content Knowledge (TPCK) instructional design process in a specific subject area. (YR)

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDT 420  Intro Teaching Learning Online  3 Credit Hours
This course will introduce students to best practices in the design, creation and implementation of instructional materials in an online environment. Students will create and implement several instructional activities and assessments in blended, hybrid and online environments. (YR)

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDT 422  Educating the Digital Learner  3 Credit Hours
Students are introduced to Universal Design for Learning (UDL) theory and how to apply it to learning activities in the blended, hybrid and online environment. Emphasis is placed on learning how to make accommodations for students in the online environment as well. Students will also learn to critically assess different approaches to online instruction. (YR)

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

EDT 430  Assistive Technology  3 Credit Hours
This course is designed as an introductory course in assistive technology (AT) including the history, relevant legislation and development of assistive technology. Students will be introduced to key AT categories by function including high tech and low tech assistive hardware, software and mobile devices to increase learning opportunities for individuals with disabilities. (YR)

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
EDT 462  Instructional Tech Internship  3 Credit Hours
A supervised field experience in which students will work as an instructional technology intern for 135 clock hours. Internship students will be placed in organizations and opportunities that align with their career goals and specific interests within the field of instructional technology. Regardless of placement, the internship is designed to provide students with real-world experiences in the development and implementation of learning activities, management of technology resources, and improving competence with various technologies. (F,W,S)
Prerequisite(s): EDT 211 and EDT 402 and EDT 410 and EDT 414 and EDT 420
Restriction(s):
Can enroll if Level is Undergraduate

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

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Frequency of Offering

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### Electrical&Computer Engin (ECE)

ECE 210  Circuits  4 Credit Hours
Fundamental laws, electrical elements and sources, energy and power. DC analysis of linear circuits. Node and mesh analysis. Operational amplifiers and op-amp circuits, Thévenin and Norton theorems. Sinusoidal steady-state response and the phasor concept. Introductory concepts on complex frequency, average power in AC circuits. Transient responses. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): (MATH 116 or Mathematics Placement with a score of 215) and PHYS 151
Corequisite(s): ECE 210L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 270  Computer Methods in ECE I  4 Credit Hours
Covers structured and object-oriented computer programming concepts in the context of the C/C++ programming language and engineering applications. Four lecture hours per week with programming assignments.
Prerequisite(s): ENGR 100 and MATH 115*
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 272  Digital Systems  4 Credit Hours
Introduction to digital logic. Topics include numbers and coding systems; Boolean algebra with applications to logic systems; Karnaugh and Quine-McCluskey minimization; combinatorial logic design; flip-flops; sequential network design; and design of digital logic circuits. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): MATH 115*
Corequisite(s): ECE 273L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 273  Digital Systems I  4 Credit Hours
Introduction to digital logic. Topics include numbers and coding systems; Boolean algebra with applications to logic systems; Karnaugh and Quine-McCluskey minimization; combinatorial logic design; flip-flops; sequential network design; and design of digital logic circuits. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): MATH 115*
Corequisite(s): ECE 273L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 276  Discrete Math in Computer Engr  4 Credit Hours
An introduction to fundamental concepts of discrete mathematics for computer engineering. Topics will be chosen from set theory, partially ordered sets, lattices, Boolean algebra, semi-groups, rings, graphical representation of algebraic systems, graphs, and directed graphs. Applications in various areas of computer engineering will be discussed.
Prerequisite(s): (MATH 116 or Mathematics Placement with a score of 215)

ECE 299  Internship/ Co-Op  1 Credit Hour
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 300  Signals and Systems  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Fourier analysis of continuous time signals and systems. Laplace transforms with applications to linear system analysis. Introduction to computer software for solving problems involving signals and systems. Three lecture hours and three recitation hours per week.
Prerequisite(s): ECE 210 and (MATH 217* or MATH 227*) and MATH 115*

ECE 305  Intro to Electrical Eng  4 Credit Hours
Introduction to electrical and electronic circuits, machinery, and instrumentation. Topics include Kirchhoff's Laws, Thévenin and Norton theorems, sinusoidal and transient circuit analysis, numerical methods, solid state electronics, motors and generators, measuring instruments. Three lecture hours and one three-hour laboratory analysis. Not open to ECE students.
Prerequisite(s): PHYS 151 and (MATH 205 or MATH 215) and (MATH 217* or MATH 227*)
Corequisite(s): ECE 305L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 306  Intro to Electrical Eng II  4 Credit Hours
Introduction to electrical and electronic circuits, machinery, and instrumentation. Topics include Kirchhoff's Laws, Thévenin and Norton theorems, sinusoidal and transient circuit analysis, numerical methods, solid state electronics, motors and generators, measuring instruments. Three lecture hours and one three-hour laboratory analysis. Not open to ECE students.
Prerequisite(s): PHYS 151 and (MATH 205 or MATH 215) and (MATH 217* or MATH 227*)
Corequisite(s): ECE 305L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 3100  Data Science I  4 Credit Hours
This course provides an overview of the mathematical techniques and computer tools needed in the field of data science. The important types of problems addressed in the field of data science are rigorously formulated and analyzed, including regression, pattern recognition and classification, time series prediction, and clustering. Effective mathematical and computational solution methodologies are discussed, including exploratory data analysis, statistical methods, and machine learning. At the end of the course, the student will have an analytic and computational toolkit with which they can solve real problems and "tell a story" with data. (F)
Prerequisite(s): (CIS 1501 or CIS 150 or ECE 270) and (MATH 217 or MATH 227 or MATH 228) and (STAT 325* or IMSE 317* or BENG 364*)
Restriction(s):
Can enroll if Level is Undergraduate
ECE 311  Electronic Circuits I  4 Credit Hours
Terminal characteristics and biasing of semiconductor diodes, bipolar and field-effect transistors, operational amplifiers. Rectifiers, amplifiers, and logic. Design projects. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 210 and (CHEM 134 or CHEM 144) and (COMP 270 or COMP 106 or COMP 220 or COMP 280 or Composition Placement Score with a score of 40)
Restriction(s):
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 314  Filter Design  3 Credit Hours
Review of filter descriptions, transfer functions, and frequency response characteristics; first and second order passive and active filters; biquad circuits; filter transformations. Butterworth, Chebyshev, and Elliptic filters; OPAMP realization of active filters; sensitivity analysis of active circuits. Three lecture hours per week.
Prerequisite(s): ECE 311 and ECE 317

ECE 316  Computer Electronics  3 Credit Hours
Design of selected electronic circuits such as signal conditioning amplifiers. Switching and digital logic circuits, using FET and BJT devices, A/D and D/A converters. Two-hour lecture and one three-hour lab per week. (YR).
Prerequisite(s): ECE 210 and ECE 273 and (COMP 270* or COMP 106* or Composition Placement Score with a score of 40 or COMP 220*)

ECE 317  Electronic Signals and Systems  4 Credit Hours
Prerequisite(s): MATH 216 and (MATH 217* or MATH 227*) and ECE 311*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ECE 3171  Analog & Discrete Sig & Sys  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Laplace and 2 transforms with applications to linear system analysis. Fourier series Fourier Transform and Discrete Fourier Transform, Frequency response, Filter design. Four lecture hours per week.
Prerequisite(s): (MATH 228 or MATH 216) and (MATH 217* or MATH 227*) and ECE 311*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ECE 319  Electromagnetic Compatibility  4 Credit Hours
Introduction, cabling, grounding, balancing and filtering, passive components, shielding, digital circuit noise and PCB layout, radiation, ESD, regulations, demos, experiments, lab projects and guest lectures. Three Lecture hours and one three-hour laboratory per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 321  Electromagnetic Fields/Waves  3 Credit Hours
Vector analysis; static electric field; steady electric currents; static magnetic fields; time-varying fields and Maxwell’s equations; plane electromagnetic waves. Three lecture hours per week.
Prerequisite(s): ECE 311*

ECE 329  Intro to Computer Music  4 Credit Hours
This course will introduce students to methods and technologies of computer music. The basics of digital audio will be covered, including sampling, quantization, and compression standards. Various analysis tools will be covered, including the Fourier transform and windowing techniques. Mathematical models of physical instruments will be introduced. Various sound synthesis strategies will be introduced: wave tables, additive synthesis, subtractive synthesis, frequency modulation, and granular synthesis.
Prerequisite(s): MATH 105
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 347  Applied Dynamics  4 Credit Hours
Introduction to rigid, multi-body dynamics tailored to the analysis and design of linkage-based robotic systems. Three dimensional kinematics, Eulerian angles, general motion of rigid bodies subjected to various forcing functions. Matrix methods, numerical and software-based problem solving. Project required. Four lecture hours per week.
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227) or MATH 228
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 351  Bio-Sensors & Instrumentation  4 Credit Hours
The course covers measurements in biological materials using a variety of sensor technologies along with electronic instrumentation design and use. Safety and FDA requirements are also presented.
Prerequisite(s): ECE 305 and (ENGR 216 or ECE 270) and MATH 216 and BIOL 103 and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

ECE 3641  Robotics I  4 Credit Hours
Design, construction, and testing of field robotic systems. Focus on electronics, instrumentation, and machine elements. Particular attention to modeling dynamic systems, measuring and controlling their behavior, and making decisions about future courses of action. Examples include industrial robots, service robots, mobile robots, and medical robots. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): (ECE 3731 or ECE 372) and ECE 347
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 370  Adv Soft Techn in Comp Engr  4 Credit Hours
Advanced concepts and techniques of modular object oriented and structured programming; representative real-world computer engineering applications including data structures, search and sorting. A term project is required. Four lecture hours per week. (F,W,S).
Prerequisite(s): ECE 270 and ECE 273*
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 371  Information Structures  3 Credit Hours
Fundamentals of computer data structures. Introduction to abstract data types. Characteristics and implementation of structured data types including arrays, stacks, queues, linked lists, generalized lists, trees, and graphs. Algorithms and applications of data structures in sorting and searching. Considerations of algorithm efficiency and complexity. Engineering applications and design. Three lecture hours per week.
Prerequisite(s): ECE 370 or ECE 274
ECE 372  Intro to Microprocessors  4 Credit Hours
Introduction to operation, interfacing, and applications of microcomputers and microprocessor-based systems. Assembly language programming, interrupts and interfacing. Three lecture hours and one three-hour laboratory per week.
Prerequisite(s): (ECE 270 and ECE 273) or CIS 310 and (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40)

ECE 3731  Microproc and Embedded Sys  4 Credit Hours
This course is an introduction to the operation, interfacing, and applications of micro processor based systems, and real-time embedded system design. Topics include: microprocessor architecture, embedded C programming, real-time programming. Final project required. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): (ECE 270 and ECE 273) or CIS 310
Corequisite(s): ECE 3731L
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 375  Intro to Comp Architecture  4 Credit Hours
Introduction to architecture of mini- and mainframe computers. CPU, memory, and I/O characteristics. Introduction to parallel architectures and hardware design languages. Case studies of popular computer systems and design considerations. A design project is required. Three lecture hours and one laboratory hour per week.
Prerequisite(s): ECE 270 and ECE 273 and (ECE 276* or MATH 276*) and (ECE 372* or ECE 3731*)
Corequisite(s): ECE 375L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 3801  Intro to Signals and Systems  3 Credit Hours
Prerequisite(s): ECE 210 and MATH 216
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 381* and (CHEM 134 or CHEM 144)

ECE 385  Elec Materials and Devices  3 Credit Hours
Introduction to properties of conductors, semi-conductors, and insulators. Definitions of stress and strain. Description of the mechanical behavior of solids. Characterization of selected materials; circuit models for resistors, capacitors, inductors, junction and field-effect transistors, etc. Three lecture hours per week.
Prerequisite(s): ECE 311* and (CHEM 144 or CHEM 134)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 3851  Intro Elect Materials & Device  4 Credit Hours
Introduction to properties of conductors, semi-conductors, and insulators. Definitions of stress and strain. Description of the mechanical behavior of solids. Characterization of selected materials; circuit models for resistors, capacitors, inductors, junction and field-effect transistors, etc. Three lecture hours per week and on three-hour laboratory session.
Prerequisite(s): ECE 311* and (CHEM 134 or CHEM 144)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 387  Digital Forensics I  4 Credit Hours
This course takes a detailed, hands-on approach to study the procedures and techniques used to identify, extract, validate, document and preserve electronic evidence. Students completing this course will be familiar with the core computer science theory and practical skills necessary to perform basic computer forensic investigations, understand the role of technology in investigating computer-based crime, and be prepared to deal with investigative bodies at a basic level.
Prerequisite(s): (ECE 270 or CIS 200) and (ECE 370* or ECE 372* or CIS 310*)
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 390  Selected Topics in ECE  1 to 3 Credit Hours
Special topics in ECE according to student’s interest and availability of instructors and equipment.

ECE 399  Internship/Co-op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 411  Electronics II  4 Credit Hours
Review of solid state devices and their physical properties, introduction to the state of art devices, design of operational amplifiers, oscillators, switching and digital circuits. A project will be required. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): ECE 301 and ECE 311

ECE 413  Intro to VLSI Design  3 Credit Hours
Introduction to digital systems and VLSI, CMOS fabrication, layout and techniques used to identify, extract, validate, document and preserve electronic evidence. Students completing this course will be familiar with the core computer science theory and practical skills necessary to perform basic computer forensic investigations, understand the role of technology in investigating computer-based crime, and be prepared to deal with investigative bodies at a basic level.
Prerequisite(s): (ECE 270 or ECE 273) or CIS 310
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 414  Electronic Systems Design  4 Credit Hours
Review of solid state device characteristics and circuit analysis. Design of selected electronic circuits such as operational amplifiers, power amplifiers, power supplies, oscillators, switching and digital circuits to further illustrate analysis and design of representative electronic circuits using classical and computer-aided design techniques. Four lecture/ laboratory per week.
Prerequisite(s): ECE 311 and ECE 270*
ECE 415  Power Electronics   4 Credit Hours
Introduction to power electronic circuit analysis and design. Power electronic circuits, power converters, power semiconductors. Time domain analysis emphasized. A design project is required. Four lecture/ laboratory hours per week.
Prerequisite(s): (ECE 317 or ECE 3171) and ECE 385

ECE 420  EMC Measurement and Testing   3 Credit Hours
Introduction to EMC measurements, RF measurement fundamentals, EM waves, radiation mechanisms, measurement and measurement systems, screened rooms, open field test sites, practical measurements, conducted emission measurements, radiated emission measurements, radiated immunity, conducted immunity and electrostatic discharge. Projects will be assigned. (YR).
Prerequisite(s): ECE 319

ECE 426  Multimedia Forensics   4 Credit Hours
The objective of this course is to introduce current state-of-the-art in digital multimedia editing, its impacts on multimedia tampering, and multimedia forensics techniques to uncover inconsistencies due to tampering. This course will cover existing digital multimedia tampering techniques such as copy-move, cut-and-paste, etc. and digital multimedia tamper detection techniques. The course will also cover covert communication methods such as steganography and covert channel detection method steganalysis. This course will cover the limitations of existing state-of-the-art in multimedia forensics. Hands-on experience will be provided in various aspects of multimedia tampering and analysis through the numerous assignments and projects. Three lecture hours per week and one three-hour laboratory per week. (F)
Prerequisite(s): (ECE 387 or CIS 387) or CIS 447 or ECE 317
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 427  Digi Content Protec   4 Credit Hours
The objective of this course is to introduce current techniques information security in general and multimedia security in particular. This course will cover existing information hiding techniques such as digital watermarking, steganography, and fingerprinting. The course will also cover conventional digital content protection methods such as cryptography. This course will cover the pros and cons of conventional and non-conventional digital content protection methods and associated design issues to give the student hands-on experience in various aspects of information security and analysis through the various assignments and projects. (W)
Prerequisite(s): (ECE 387 or CIS 387) or CIS 447 or ECE 317
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 428  Cloud Computing   3 Credit Hours
Cloud computing represents the emerging Internet-based services/platforms with elastic and scalable computation powers operating at costs associated with service. Topics may include advanced web technologies (AJAX and Mashup), distributed computing models and technologies (Hadoop and MapReduce), Infrastructure-as-a-Service (IaaS), Software as a Service (SaaS), Platform-as-a-Service (PaaS), virtualization, parallelization, security/privacy, and other issues in cloud computing. This course will also explore the current challenges facing cloud computing. Course work will include homework assignments, presentations and a term project. Students cannot take both ECE 428 and ECE 528 for degree credit. Three lecture hours per week.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 431  Electrical Eng Design   4 Credit Hours
The course is conducted as a guided project design course with the class divided into teams and assigned a specific design project. Periodic progress reports are submitted during the term. A final written report and an oral presentation including demonstration are required at the end of the term. Cost analysis, evaluation of design alternatives and application of engineering principles are emphasized. Two scheduled contact hours and six hours open laboratories per week.
Prerequisite(s): ECE 311 and ECE 373 and ECE 493*

ECE 432  Electrical Eng Design   6 Credit Hours
The course is conducted as a guided project design course over a two-semester period with the class divided into teams and assigned a specific design project. Periodic progress reports are submitted during the term. A final written report and an oral presentation including demonstration are required at the end of the term. Cost analysis, evaluation of design alternatives and application of engineering principles are emphasized. Two scheduled contact hours and six hours open laboratories per week.
Prerequisite(s): ECE 311 and ECE 372 and ECE 493*

ECE 433  Intr to Multimedia Technologies   4 Credit Hours
This course will introduce students to basic terminology and methods of multimedia. Basic concepts of digital audio will be reviewed, including frequency, sampling, and popular compression schemes. Concepts of digital images will be introduced, such as resolution, color theory, and compression formats. Basic concepts of digital video and animation will be introduced. Relevant web technologies will be reviewed. Four lecture hours per week.
Prerequisite(s): ECE 311 or ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ECE 434  Machine Learning in Engin   4 Credit Hours
Introduce fundamental theories and basic techniques in machine learning with an emphasis on engineering applications. Topics include learning concepts, search algorithms, neural networks, fuzzy learning, paradigms for problem solving using machine learning. (F, W).
Prerequisite(s): ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
ECE 435  Intro to Mobil/Smrt Dev & Tech  4 Credit Hours
This class will introduce students to the technology used in mobile/ smart devices and mobile communication networks. Various hardware and software aspects will be introduced, with particular emphasis on the constraints intrinsic to such systems. Students will get an overview of various mobile operating systems and how to develop software for mobile devices. Four lecture hours per week.
Prerequisite(s): ECE 372 or ECE 3731
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering

ECE 436  Elec Machines & Hybrid Drives  4 Credit Hours
This is an introductory course on electric machines and drive systems and their application in EV, HEV, PHEV and FCV powertrains. The objectives are to familiarize the students with the basic concepts of electromechanical energy conversion and electric drive systems. Students are expected to be able to analyze and design electric drive systems for automotive powertrain applications. The topics covered in this course include DC machines, induction machines, permanent magnet synchronous machines, and switched reluctance motors and drives. Case studies in automotive applications such as electric and hybrid drivetrains will be discussed. Four lecture hours per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering

ECE 4361  Electric Machines and Drives  4 Credit Hours
This is an introductory course on electric machines and drive systems and their application in HEV/PHEV powertrain and other industrial and residential systems. The objectives are to familiarize the students with the basic concepts of electromechanical energy conversion and electric drive systems. Students are expected to be able to analyze and design electric drive systems for automotive, industrial, and residential applications. The topics covered in this course include DC machines, induction machines, permanent magnet synchronous machines, and switched reluctance motors and drives. Case studies in automotive applications such as electric and hybrid drivetrains, industrial and residential electric variable speed drive systems, will be discussed. Students cannot take both ECE 436 and ECE 4361 for credit. Four lecture hours per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering

ECE 437  Intro to Automotive Cybersec  4 Credit Hours
The objective of this course is to introduce modern vehicles, in-vehicle communication networks and protocols such as CAN, LIN, and so on, threat models, diagnostics, and penetration testing. This course will cover existing in-vehicle communication protocols and associated vulnerabilities. Students are expected to learn penetration testing for automotive systems. This course will cover the limitations of existing state-of-the-art in multimedia forensics. Simulation tools, labs and projects will be used to provide hands-on learning experience in various aspects of in-vehicle communication. (W,YR).
Prerequisite(s): ECE 3731* or ECE 372*
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 438  Web Engr. Prin & Tech  4 Credit Hours
Advanced concepts and techniques of web technology, focusing on interactive applications; real-world web engineering applications including data persistence, web security, hardware/software issues and asynchronous client/server communication. A term project is required. Four lectures per week.
Prerequisite(s): ECE 311 or ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering

ECE 439  Intr to Electric Power Systems  3 Credit Hours
This course will introduce students to basic methods of electric power systems. Topics include AC circuits, phasors, complex power and complex impedance, transformers, per unit system, transmissions lines, power flow, economic dispatch, real and reactive power control, symmetric and unsymmetric faults, transient stability, relaying and protection. Three lecture hours per week.
Prerequisite(s): ECE 317 or ECE 3171

ECE 443  Vehicular Pwr Sys & Loads  4 Credit Hours
This is an introductory course on power systems and load analysis with focus on automotive applications. The objectives are to familiarize the students with the basic principles and concepts of vehicular power systems and loads. Students are expected to be able to analyze and design basic vehicular power systems. The topics covered in this course include an overview of power systems, vehicular power system architecture, DC and AC power grid in vehicular systems, power system stability, reliability, reactive power control, load flow analysis, short circuit analysis, and vehicular power system protection. Four lecture hours per week.
Prerequisite(s): ECE 317 or ECE 3171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
ECE 4432  Renewable Elec Pwr Sys  4 Credit Hours
This course is an introduction to traditional power grids as well as renewable electric power systems. This course covers long-distance transmission of electric power with emphasis on admittance and impedance modeling of components and systems, complex power-flow studies, symmetrical and unsymmetrical fault calculations, economic operation of large-scale generation and transmission systems, an overview of emerging renewable energy technologies (e.g. wind and solar) and the impact of grid integration of renewable energy on power grids. Students cannot take both ECE 4431 and ECE 4432 for credit. Four lecture hours per week.
Prerequisite(s): ECE 3171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering

ECE 446  Electromechanical Energy Conv  4 Credit Hours
Introduces fundamental concepts and specifications of electromechanical energy conversion: AC and DC machines drive, electric and magnetic storage and transfer, transformer, and performance analysis of AC and DC machines. The topics include principles of energy conversion, permanent magnet synchronous machines, induction machines, and DC machines. The lab projects for the course will focus on modeling, evaluation, and practice of AC and DC machine drives based on computer simulation and DSP based experiments; transient and dynamic analysis; linearization and small signal analysis of machines. Four lecture/laboratory hours per week.
Prerequisite(s): ECE 311 and (ECE 317* or ECE 3171*)

ECE 450  Analog and Digital Comm Sys  4 Credit Hours
Topics include introduction to communication systems, baseband communications, sampling theorem, amplitude and frequency modulation system design, statistical analysis of error and performance, digital modulation of analog signals, digital communication and digital modulation schemes, random processes and applications in digital communications, and noise analysis, optimal receiver. Four lecture hours per week.
Prerequisite(s): (ECE 317 or ECE 3171) and IMSE 317

ECE 451  Signal Detection  3 Credit Hours
Introduction to signal detection, parameter estimation and information extraction theory and its application to communication systems. Subject areas covered within the context of a digital environment are decision theory, detection and estimation of known and random signals in noise, adaptive recursive digital filtering, optimal linear filtering and pattern recognition. Three lecture hours.
Prerequisite(s): ECE 450

ECE 452  Probabilistic Meth/Signal Alys  3 Credit Hours
Introduction to probability, random processes, correlation functions, and spectral density. Response of linear systems to random inputs. Applications in the field of communications.
Prerequisite(s): ECE 300

ECE 454  Intr to Modern Wireless Comm  3 Credit Hours
This course provides an introduction to the fundamentals of modern wireless communication. The focus of this course will be on the (i) basic signal propagation issues and channel impairments, (ii) modulation schemes and bandwidth/power trade-offs, and (iii) overcoming channel impairment using equalizers, diversity and channel coding. Additionally case studies will examine current wireless LANs and cellular system. Three Hours of lecture per week.
Prerequisite(s): ECE 450 or ECE 471
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 456  Intro to Electro-optics  3 Credit Hours
Laser sources, detectors, imaging systems, optical signal processing, illumination and image acquisition, triangulation, and fiber optics. Three one-hour lecture periods.
Prerequisite(s): ECE 311 and ECE 321

ECE 460  Automatic Control Systems  4 Credit Hours
Modeling and response of dynamic systems. Transfer functions, poles and zeros and their significance to transient and steady state response of feedback systems. Analysis of stability of closed-loop systems. Steady state errors and transient performance of closed-loop systems. Design of feedback control systems by root locus techniques and by frequency domain methods. Laboratory projects include modeling, controller design, controller realization, system performance evaluation, and simulation studies. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 317 or ECE 3171
Corequisite(s): ECE 460L

ECE 464  Robotics  4 Credit Hours
Prerequisite(s): (ECE 300 or ECE 365) and ME 265

ECE 4641  Robotics II  4 Credit Hours
This is the second of a two-course sequence introducing foundational theory and applications of robotics engineering. The topics of this course include embedded computing, locomotion, localization, dead reckoning, inertial sensors and perception, navigation, multi-robotics systems, and human-robot interaction, and complex response processes. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 3641 and ECE 370 and IMSE 317
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 465  Digital Control Design and Imp  4 Credit Hours
Discrete model of a continuous-time system. Differential equations and Z-transforms. Similarities and differences between discrete-time and continuous-time models. Translation of analog designs to digital designs. State-space methods including state feedback and observers. Hardware limitations and implementation issues. Four lecture/laboratory hours per week.
Prerequisite(s): ECE 460
ECE 467 Digital Forensics II  4 Credit Hours
This course is a continuation of Digital Forensics I and will focus on Internet Forensics. Students will examine in-depth concepts in Internet evidence collection and preservation, as well as applications of contemporary commercial forensic investigative software. **Prerequisite(s):** (ECE 387 or CIS 387) and (ECE 471* or CIS 427*)  **Restriction(s):** 
Cannot enroll if Class is Freshman  
Cannot enroll if Level is Rackham or Graduate  
Cannot enroll if College is Business 

ECE 470 Computer Int and Data Comm  4 Credit Hours
Hardware and software techniques used in interfacing between computers and other computers or devices. Analog and digital techniques. Parallel and serial communications. Popular communication protocols. Error detection and correction. Lab project involves interfacing and communicating with a microprocessor. **Prerequisite(s):** ECE 372 

ECE 471 Comp Networks/Data Comm  4 Credit Hours
Hardware and software techniques used in interfacing between computers and other computers or devices. Data transmission techniques and protocols. Introduction to popular local area network protocols. Forward Error Control Techniques and Data Compression. Introduction to wireless communications with focus on major challenges and obstacles and the cellular phone infrastructure. Term projects involve developing a data link layer protocol for interfacing and communication with microprocessors. Four lecture hours per week. **Prerequisite(s):** (ECE 372 or ECE 3731) and (IMSE 317 or BENG 364) 

ECE 473 Embedded System Design  4 Credit Hours
This course studies the issues dealing with real-time embedded system design. Topics include: microprocessor architecture, assembly language, real-time programming, space and time limitations, relations between ANSI C compiler output and assembly language, compiler linkers and using a system development package for C programming. (F,W,S). **Prerequisite(s):** ECE 372 or ECE 3731  **Corequisite(s):** ECE 473L 

ECE 474 Compiler Design  3 Credit Hours
Principles of language compilation. Introduction to formal languages. Lexical analysis, top-down and bottom-up parsing, code generation and optimization. Error handling and symbol table management. Runtime storage management. Programming language design. Introduction to compiler-writing tools. A software design project is required. Three lecture hours per week. **Prerequisite(s):** ECE 370 

ECE 475 Comp Hardware Org/Design  4 Credit Hours
Design methodology, performance analysis using probability and statistic methods, hardwired and microprogrammed in CPU design, hardware design languages and memory design. Advanced concepts in computer architecture. A design project is required. Three lecture hours per week and one three-hour laboratory per week. **Prerequisite(s):** ECE 375 

ECE 476 Intro to Parallel Processing  3 Credit Hours
Advances in computer architecture, parallel structures, performance evaluation, memory bandwidth considerations, processing bandwidth, communication and synchronization. A design project is required. Three lecture hours per week. **Prerequisite(s):** ECE 375 

ECE 478 Operating Systems  4 Credit Hours
Introduction to computer operating systems. Process management, threads, CPU scheduling, memory management, process synchronization, file systems and I/O devices. Selected advanced topics, e.g., distributed systems, deadlock, I/O, job scheduling, and performance analysis using queueing models, will be introduced. Case studies of modern operating systems. A design project is required. Four lecture hours per week. **Prerequisite(s):** ECE 370 and IMSE 317 

ECE 479 Artificial Intelligence  3 Credit Hours
Basic concepts and methodology of artificial intelligence from a computer engineering perspective. Emphasis is placed on the knowledge representations, reasoning and algorithms for the design and implementation of intelligent systems. Introduction to an AI language and representative intelligence systems. A design project is required. Three lecture hours per week. **Prerequisite(s):** ECE 370 

ECE 480 Intro to Dig Signal Processing  4 Credit Hours
Fundamentals of discrete-time signals and systems. Introduction to z-transform and its applications. Design of digital filters. Characteristics of analog-to-digital and digital-to-analog converters. Fourier transform of sequences, DFT and FFT algorithms. An introduction to software tools for the simulation and design of real time-digital filters. Implementation of digital systems using digital signal processing boards. Three hours lecture and three hours laboratory experiments per week. **Prerequisite(s):** (ECE 317 or ECE 3171) and (MATH 217 or MATH 227 or MATH 228)  **Corequisite(s):** ECE 480L  **Restriction(s):**  
Can enroll if College is Engineering and Computer Science 

ECE 488 Introduction to Machine Vision  4 Credit Hours
Applications to machine vision. Representative topics are: optics and lighting, sensor characteristics, image acquisition, image analysis, segmentation, connectivity, shape description, hardware for vision applications, software considerations, applications including automatic inspection and metrology. Open lab and project will be required. **Prerequisite(s):** ECE 270  **Restriction(s):**  
Can enroll if Class is Senior 

ECE 4881 Introduction to Robot Vision  3 Credit Hours
This course introduces the theories and modern technologies in robot vision. Topics include sensors, image analysis, region and segmentation, object recognition, stereo vision, optical flow, color image, object tracking and applications. Students cannot receive credit for both ECE 4881 and ECE 588. Three lecture hours per week. **Prerequisite(s):** ECE 270  **Restriction(s):**  
Can enroll if Class is Junior or Senior  
Can enroll if Level is Undergraduate  
Can enroll if College is Engineering and Computer Science  
Cannot enroll if Major is 

ECE 490 Selected Topics in Elec Engin  1 to 3 Credit Hours
Advanced or applied topics in electrical engineering offered according to student’s interest and availability of instructors and equipment. Lecture hours, laboratory, and/or computation period to be arranged.
ECE 491  Directed Studies  1 to 4 Credit Hours
Student in consultation with a faculty advisor will prepare a proposal in sufficient detail describing a subject topic to be studied. The proposal will be subject to approval by the department. A formal written and oral evaluation of the work performed are required for successful completion. Lecture hours, laboratory, and/or computation periods to be arranged.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 492  Directed Research  1 to 4 Credit Hours
Student, in consultation with a faculty advisor will prepare a proposal in sufficient detail describing a research problem to be studied. The proposal will be subject to approval by the department. A formal written and oral evaluation of the research performed are required for successful completion. Lecture hours, laboratory, and/or computation period to be arranged.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 493  Design Factors in Eng  2 Credit Hours
This course is comprised of a series of lectures on the subject of design. It will promote awareness of factors such as literature review, performance specifications, design considerations, product liability, standards and ethics, professional registration codes, patents and copyrights, packaging, documentation and report preparation. Two lecture hours.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 495  Micro Systems Design  4 Credit Hours
Course content includes discussion and laboratory experience on a number of interfacing topics (timing, serial and parallel communication, ADC/DAC, control loop) and the preparation of a major report on a design topic approved by the course instructor. Team design projects may involve either software or hardware, or both. Two lecture hours and two three-hour laboratories per week.
Prerequisite(s): ECE 373 and (ECE 311 or ECE 316)

ECE 4951  Sys Design and Microcontrollers  3 Credit Hours
Techniques for interfacing actuators and sensors to computers with emphasis on the use of a variety of microprocessors and a broad range of sensors. Topics include introduction to small microprocessors such as PIC16, PIC18, small systems such as oopic,basicx as well as using a PC as a controller. Control of motors and other actuators using opto-isolators and discrete electronics, use of H-bridges. Interfacing sensors that provide different encoding data, such as analog signals, digital communication using I2C protocol, handshake I/O, pulse width encoding. Interfacing to wireless communication using RF or IR. Includes laboratory experiments, individual midterm project and a final team project. Three lecture hours per week. (FW)
Prerequisite(s): ECE 311 and (ECE 372 or ECE 3731)

ECE 498  Senior Engineering Design  3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.
Prerequisite(s): (ECE 311 or ECE 316) and ECE 373

ECE 4981  Electrical Engineering Des I  2 Credit Hours
This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or COMP 280) and (ECE 317 or ECE 3171) and (ECE 372 or ECE 3731) and (ECE 414 or ECE 415 or ECE 450 or ECE 460 or ECE 480 or ECE 4951)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4982  Computer Engineering Des I  2 Credit Hours
This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or COMP 280) and (ECE 372 or ECE 3731) and ECE 375 and (ECE 471 or ECE 473 or ECE 475 or ECE 478)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4983  Electrical Engin Design II  2 Credit Hours
Second Semester ? Electrical Engineering Design This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.
Prerequisite(s): ECE 4981
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior
Can enroll if College is Engineering and Computer Science

ECE 4984  Computer Engin Design II  2 Credit Hours
Second Semester Computer Engineering Design This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.
Prerequisite(s): ECE 4982
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior
Can enroll if College is Engineering and Computer Science
ECE 4985  Electrical Engineering Design  3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives, and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40) and (ECE 317 or ECE 3171) and ECE 372 and (ECE 414 or ECE 415 or ECE 450 or ECE 460 or ECE 480 or ECE 4951)
Restriction(s):
Can enroll if Class is Senior

ECE 4986  Computer Engineering Design  3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation, and application of demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.
Prerequisite(s): (COMP 270 or Composition Placement Score with a score of 40 or COMP 106 or COMP 220) and (ECE 317 or ECE 3171) and ECE 372 and ECE 375 and (ECE 471 or ECE 473 or ECE 478 or ECE 475)
Restriction(s):
Can enroll if Class is Senior

ECE 4987  Robotics Engineering Design I  2 Credit Hours
This course is conducted as a guided project design course over a two-course sequence, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.
Prerequisite(s): ECE 311 and ECE 3171 and (ECE 372 or ECE 3731) and ECE 3641 and (ECE 460 or ECE 4641)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4988  Robotics Engineering Design II  2 Credit Hours
Second semester Robotics Engineering Design: This course is conducted as a guided project design course over a two-course sequence, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.
Prerequisite(s): ECE 4987
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 499  Internship/Co-op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Senior
ENGR 250R  Prin of Eng Materials Rec  0 Credit Hours
Recitation component for ENGR 250. Must be taken concurrently with ENGR 250.
Corequisite(s): ENGR 250

ENGR 290  Study Abroad Technical Subj  1 to 4 Credit Hours
200-level study abroad course in technical subjects.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

ENGR 332  Speech for Professionals  3 Credit Hours
Professionals must effectively communicate in the technical and business environment of a company organization. The course pays particular attention to verbal communications within and between organizations, focusing on multiple audiences and their varying needs for information. Stressing audience awareness, organization, clarity and efficiency in speaking, it will improve speaking skills necessary for confident verbal presentations such as professional briefings and conferences.

ENGR 350  Nanoscience and Nanotechnology  4 Credit Hours
The terms "nanoscience" and "nanotechnology" have come to mean many different scientific and technical disciplines. The course will introduce students to the fundamentals of nanoscience and nanotechnology. Interesting phenomena about individual nanometer scale objects will be discussed. The difference in properties of objects of nanometer scale, containing hundreds or thousands of atoms and those exhibited by individual atoms or molecules or the properties of materials at the macroscale with which we are most familiar will be covered. The analytical techniques that are used to characterize these objects will be discussed. The manufacturing techniques used to make these objects along with their applications will be covered. Cost benefit analysis of nanotechnology and its future will be discussed. (YR)
Prerequisite(s): PHYS 151 and (CHEM 124 or CHEM 134 or CHEM 144)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters
Cannot enroll if Major is

ENGR 360  Des Inovtn: Proc, Meth & Prcct  4 Credit Hours
Design Innovation: Process, Method and Practice is a highly interactive project-based introduction to design, structured as a hands-on course. This course brings a holistic vision to design innovation. Students work in teams that follow a process of immersion of user experiences, exploration of ideas and prototyping of potential solutions. To work effectively as a team, collaboration and project management concepts and methods are introduced. The course consists of two instructional elements: regular class lectures and in class hands-on exercises based on case studies. In addition, a semester long team based project allows students to apply classroom learnings to real life design problems. Teams present their design concepts, showcase prototypes in engaging and thoughtful ways. (F, W)
Restriction(s):
Can enroll if Class is Junior or Senior

ENGR 390  Study Abroad Technical Subj  1 to 4 Credit Hours
300-Level study abroad topics in technical subjects.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

ENGR 390F  Study Abroad Technical Subj  3 Credit Hours
Topic: Fuel Cell Principles. In this course the physical laws of thermodynamics and fluid mechanics will be applied to industrial components and equipment. Approved as an upper-level ME elective.
Prerequisite(s): ME 230

ENGR 399  Experiential Honors Prof. Prac  1 Credit Hour
Full Course Title: Experiential Honors Professional Practice-To provide undergraduate engineering and computer science students with an opportunity to develop skills, abilities, and behaviors through both hands-on learning and exposure to the professional work environment. The course provides supervised work experiences relevant to their degree programs with mutually agreed upon engineering work assignments among the student, employer and faculty advisor. (FWS)
Prerequisite(s): CIS 275 or (ECE 210 and ECE 273) or (IMSE 255 and IMSE 317) or (ME 230 or ME 260) and (ENGR 126 and ENGR 216 and ENGR 250)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ENGR 400  Appl Business Tech for Engr  3 Credit Hours
This course will introduce the students those business skills/tools that will be needed in their jobs soon after graduation and will make them better and well-rounded engineers. They will be able to function better within today's global business environment. The major topics of the course are management finance including cost accounting, organizational behavior, program and project management and business related system thinking. Three hours of lecture per week.
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Senior
Can enroll if Level is Undergraduate or Professional Development

ENGR 490  Study Abroad Technical Subj  1 to 4 Credit Hours
400-level study abroad course in technical subjects.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

ENGR 492  Exper Honors Directed Research  1 Credit Hour
Full Course Title: Experiential Honors Directed Research. The Experiential Honor Directed Research project involves performing laboratory/experiential research under the supervision of a faculty member. The course involves regular meetings with the supervising faculty member and reading relevant research articles. Engineering student are expected to design and conduct experiments, and to analyze and interpret data. Computing students are expected to analyze a problem, and identify and define the computing requirements appropriate to its solution. A research project report and an oral presentation are expected at the end of the semester. (FWS)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
ENGR 493  Exper Hns Dir Dsgn  1 Credit Hour
Full Title: Experiential Honors Directed Design The Experiential Honors Directed Design project involves the design, analysis, building and testing of software (a computer-based system, process, component, or program) or hardware (a component, assembly, device or system) to meet desired needs. A design project report and an oral presentation are expected at the end of the semester. (F,W,S).
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

English (ENGL)

ENGL 200  Intro to English Studies  3 Credit Hours
An introduction to English Studies for English concentrators. The course provides students with the interpretive, analytical and basic research skills, the critical vocabulary, the understanding of genre, and the knowledge of major critical approaches necessary for the study of literature. Readings will consist primarily of poetry, fiction, drama, and non-fiction prose written in English by British and American authors, but the course will also include other historical and cultural texts as well as works of criticism. Students will submit at least 20 pages of written work for extensive instructor feedback. (F,W)
Prerequisite(s): COMP 105 or COMP 110 or Composition Placement Score with a score of 30

ENGL 223  Intro to Creative Writing  3 Credit Hours
An introduction to the writing of poetry, the short story, and/or the play. Considerable writing, analysis, criticism, and discussion. (F,W).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 230  Introduction to Literature  3 Credit Hours
Introduces students to imaginative literature in several genres, including, for example, fiction, poetry, and drama. Stress will be both on appreciation of the aesthetic and cultural value of reading literature and on understanding the process of reading sensitively and intelligently.

ENGL 231  Intro to Literature: Poetry  3 Credit Hours
A disciplined introduction to the reading of poetry, English and American. (F,W).

ENGL 232  Intro to Literature: Fiction  3 Credit Hours
A disciplined introduction to the reading of short stories and novels, English and American. (F,W).

ENGL 233  Intro to Literature: Drama  3 Credit Hours
A disciplined introduction to the reading of plays, English and American. (F,W).

ENGL 238  Intro to Lit: Arab American  3 Credit Hours
This course in an introduction to Arab American literature, its historical and cultural contexts and contemporary relevance. Topics will include the literary and cultural productions of Arab immigrants, their transnational vision, and explorations of such concepts as home, memory and identity; the literary, dramatic and poetic responses of Arab Americans to 9/11 and the ongoing war on terror; the role Arab American literature in offering different versions of Arab and Arab American lives and experiences from the one circulated in mainstream media, Hollywood cinema and culture.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 239  Intro to Lit: African American  3 Credit Hours
A study of African-American literature designed to expose students to important periods, works, and authors within historical context. Topics will include slavery, reconstruction, the Great Migration, the Harlem Renaissance, and the contemporary renaissance in Black women's literature. Students will be required to read, critically discuss, analyze, and write their responses to several literary genres that will be incorporated (fiction, drama, poetry).

ENGL 301  Literary Criticism  3 Credit Hours
This course introduces literary criticism and theory from Aristotle to the present, focusing on the changing concept of literature's nature and function. Lectures, readings, and discussion cover such critics as Aristotle, Dryden, Pope, Johnson, Wordsworth, Coleridge, Arnold, T.E. Hulme, I.A. Richards, T.S. Eliot, and such movements as New Criticism, Phenomenology, Reader-Response, Archetypal Criticism, Structuralist-Semiotic Criticism, Psychological approaches to literature, New Historicism, Marxism, Feminism, and Deconstruction.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 304  Studies in Detroit Culture  3 Credit Hours
This course is an attempt to define a modern cultural history of Detroit. Taught by two faculty members, the emphasis of the course will vary but the following aspects of the city's cultural history will be covered in some detail: its literature, arts, music, and architecture; its social conditions and broader American culture context. (AY).

ENGL 306  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic, and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience.
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270
Restriction(s):
Can enroll if Level is Undergraduate
ENGL 310  Narrative Journalism  3 Credit Hours
Students learn to identify, understand and use the techniques of fiction in the service of nonfiction material. While studying the texts as literature, students are also encouraged to view them as models for writing.
Assignments include the writing and revising of articles, based on research and interviews, and written in story form, drawing on literary techniques. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 311  British Lit: Beowulf to Milton  3 Credit Hours
A study of British literature from the Anglo-Saxon period to the works of John Milton, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 312  British Lit: Milton to 1900  3 Credit Hours
A study of British literature from the works of John Milton to 1900, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 313  American Lit: Colonial to 1900  3 Credit Hours
A study of American literature from the Colonial period to 1900, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 314  Brit & Amer Lit: 1900-Present  3 Credit Hours
A study of British and American literature from 1900 to the present, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 322  SiD--Writing in Detroit  3 Credit Hours
Full Title: Semester in Detroit: Writing on Detroit--Beyond the Other. This course serves as an elective course for the Semester in Detroit (SiD) program. It is devoted to short fiction in search of a creative rendering of the people in Detroit, a city which offers rich opportunities to explore the theme of the "other". Students will develop short narratives that capture their impressions of the city through its people. Each student will find Detroiters to "study" and creatively report on. Class discussions will help direct students. (S)

ENGL 323  Advanced Creative Writing  2 to 3 Credit Hours
Practice in writing poetry, the short story, the novel, and/or the play. May be repeated to a maximum of six credit hours. (OC).
Prerequisite(s): ENGL 223 or COMP 223

ENGL 327  Advanced Exposition  3 Credit Hours
A study of rhetorical theory and its application to various types of expository essays. Writing assignments will reflect the types of essays studied. May be repeated to a maximum of six credit hours. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 331  Online Reporting, Research, Writing  3 Credit Hours
Course introduces the technical, social, legal and ethical practice of online research, focusing on research skills required by journalists and other writers. Students use new media technology to generate ideas, to research subjects, and to develop general-audience writing projects in their areas of interest. Course covers the use of Web search engines, directories and databases; finding sources and interviewing people online; evaluating the credibility of online sources and information; using Lexis-Nexis to access archives and public records; and using spreadsheet and database programs.
Prerequisite(s): COMP 106 or COMP 110 or COMP 270 or Composition Placement Score with a score of 40

ENGL 341  Religion and Literature  3 Credit Hours
An investigation of the ways in which religious ideas and practices have informed works of literature, and vice versa. Surveying a variety of genres and themes, the course will focus mainly on British and/or American literature and its engagement with Judeo-Christian religion, though some attention may be devoted to other literary and religious traditions (e.g., ancient and medieval texts, European and world literature, Islam and Eastern religions).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 343  Adaptations of Literary Texts  3 Credit Hours
This course explores the adaptation of literary texts in a variety of literary genres (poetry, drama, fiction) to other artistic mediums (film, graphic novels/comics, paintings, etc.). Moving beyond limited comparisons of "good" originals and "bad" adaptations, this course focuses on the dialogue among multiple versions of the same story across a range of historical periods, asking how and why adaptations modify their sources in a particular manner. This course addresses the difference between adaptation and appropriation as well as imitation, quotation, allusion, pastiche, and parody.
Prerequisite(s): (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 349  The Bible In/As Literature  3 Credit Hours
This course will study selected readings from the Bible, first in regard to their own literary, historical, and cultural contexts, and then in regard to their reception, interpretation, and reapplication by later literary tradition. Biblical selections may cover both the Old and New Testaments as well as Apocryphal traditions, while readings from later non-biblical texts will be drawn from various literary periods.
Prerequisite(s): (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
ENGL 356  Reading Urban Monstrosity  3 Credit Hours
This course questions the literary techniques and forms the English writers developed between 1660 and 1900 to characterize and imagine London to be a unified community and to counter the growing perception of London as a "monstrous city." This image of "the English-speaking City" as an uncontrollable monster may be explored in writings by Daniel Defoe, Jane Austen, Elizabeth Gaskell, Robert Louis Stevenson, Charles Dickens, Thomas Hardy, and Joseph Conrad.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 358  Shakespeare on Film  3 Credit Hours
The course examines the adaption of Shakespeare’s play-scripts for the screen. It goes beyond a discussion of the relative merits of plays and their respective film adaptations, examining the complex exchanges between the two artistic mediums (e.g. how stage convention such as soliloquies or off-stage action are adapted to the screen; how early silent films were used to market stage productions, etc.). It will approach the issue of adaption by examining the works of key directors, multiple films of a single play, silent films, foreign language adaptions, mass market and art house films, and films which deal with fictive or actual productions of Shakespeare’s plays. Special emphasis will be placed on specific stage productions that are later adapted to films. In this course, students will explore a broad range of responses to and interpretations of Shakespeare’s works. This class will stress the idea that each staging is an interpretation of the play, its point of view conditioned by the times, the medium, and the director’s vision. (OC)

Restriction(s):
Can enroll if Level is Undergraduate

ENGL 368  20C/21C British/Amer Poetry  3 Credit Hours
A survey of 20th- and 21st- century British and/or American poetry and poets, including such authors as Wallace Stevens, W.H. Auden, T.S. Eliot, Dylan Thomas, Langston Hughes, and Sylvia Plath.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 370  Narratives of Film and Lit  3 Credit Hours
Explores the narrative conventions of literary and filmic fictions in a cultural, historical, and psychoanalytic context. Goes beyond a discussion of the relative merits of novels and their respective film adaptations and examines the more complex interchanges between the two narrative forms, the ideological function of narrative in contemporary adaptations and examines the more complex interchanges between the two artistic mediums (e.g. how stage convention such as soliloquies or off-stage action are adapted to the screen; how early silent films were used to market stage productions, etc.). It will approach the issue of adaption by examining the works of key directors, multiple films of a single play, silent films, foreign language adaptions, mass market and art house films, and films which deal with fictive or actual productions of Shakespeare’s plays. Special emphasis will be placed on specific stage productions that are later adapted to films. In this course, students will explore a broad range of responses to and interpretations of Shakespeare’s works. This class will stress the idea that each staging is an interpretation of the play, its point of view conditioned by the times, the medium, and the director’s vision. (AY)
Prerequisite(s): HUM 248 or ENGL 248 or FILM 248 or JASS 248

ENGL 372  Eng Lit: 1500 to 1600  2 to 3 Credit Hours
A survey of English literature from the beginnings of the Renaissance in England through the works of Sidney, Spenser, and Shakespeare (excluding his plays).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 373  English Lit 1600-1660  3 Credit Hours
A survey of English literature from Jonson, Bacon, and Donne through the Metaphysicals, the Cavaliers, and Milton’s early poems. Representative prose works will also be studied.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 374  Restoration and Early Eighteenth-Century Literature  3 Credit Hours
A survey of English literature of the Restoration and early 18th century, with special emphasis on verse satire (Swift, Montague, and Pope), Restoration drama (Behn, Wycherly, and Congreve), and the origins of the English novel (Defoe, Fielding, and Richardson). (OC)
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250

ENGL 375  The Age of Johnson and Burney  3 Credit Hours
A survey of English literature of the late 18th century. Readings address the literary gothic, Boswell’s journals, the “graveyard school” of poetry, Samuel Johnson’s poetry and prose, the 1789 revolutionary fervor, and the novels of Frances Burney and Jane Austen.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 376  Brit Lit in Romantic Era  2 to 3 Credit Hours
A survey of British literature from 1789 to 1832 with special emphasis on the rise of Romantic poetry.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 377  Victorian Poetry and Prose  2 to 3 Credit Hours
A survey of British poetry and prose during the reign of Queen Victoria 1837 to 1901.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 381  Intro to Postcolonial Studies  3 Credit Hours
This course offers a general introduction to Postcolonial Studies - a field of cultural inquiry that questions how personal identity (specifically race, language and ethnicity) shapes, and is shaped by, the politics of colonization and nationalism. Students will clarify the subject of Postcolonial Studies by examining a variety of cultural and linguistic objects (literature, film, TV-journalism, slave- and middle-passage-narrative, and political manifesto) from a variety of cultural perspectives (Arab American, Anglo-Indian, West African, and Caribbean).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250)
ENGL 386 Gender Issues in Literature 3 Credit Hours
A study of gender issues in English and American literature. The exact topic will vary from semester to semester, but the course may feature such topics as gay and lesbian literature, feminist criticism, images of masculinity, the representation of sexual ideologies, etc. Course may be repeated for credit when specific topic differs.
Prerequisite(s): ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200

ENGL 389 The Odyssey of Blk Men in Amer 3 Credit Hours
This course will examine the struggle of African American men for personal, political, and creative expression. This course incorporates several literary genres (narrative, fiction, essay, drama, and poetry) and the literary voices of black men who range from professional writers to politicians, from athletes to actors. Students will be required to critically read, discuss, analyze, and write their own responses to the literature found in the texts.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 390 Topics in English 3 Credit Hours
Examination of problems and issues in selected areas of English. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 394 Psychology and Theater 3 Credit Hours
The linkages between psychology and theater are analyzed from the perspective of the actor, the audience, and the analyst (both psychotherapeutic and literary). This includes ties between plays and theories of human behavior, psychodrama, and self-insight through performance. Class involves a significant experiential component.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 399 Independent Studies in English 1 to 3 Credit Hours
Readings or analytical assignments in English, selected in accordance with the needs and interests of those enrolled and agreed upon by the instructor and the student. May be repeated for a maximum of 6 credit hours. (FW).

ENGL 408 Shakespeare I: Earlier Works 3 Credit Hours
Intensive study of selected works from the first half of Shakespeare’s career, designed to increase the student’s critical appreciation and understanding. Students cannot receive credit for both ENGL 408 and ENGL 508.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 409 Shakespeare II: Later Works 3 Credit Hours
Intensive study of selected works from the second half of Shakespeare’s career, designed to increase the student’s critical appreciation and understanding. Students cannot receive credit for both ENGL 409 and ENGL 509.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 410 Maj Engl Authors of the Renais 2 to 3 Credit Hours
An investigation of significant themes and attitudes current in the Renaissance, as seen through an intensive examination of the works of two or three major authors, such as More, Spenser, Bacon, and Donne.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 413 Shakespeare's Contemporaries 2 to 3 Credit Hours
An examination of the performance and cultural contexts of plays by English Renaissance playwrights (Marlowe, Middleton, Webster, Jonson, etc.), working around the time of Shakespeare. A limited number of Shakespeare's plays may be included.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Level is Undergraduate

ENGL 420 Maj Engl 18th-Century Authors 2 to 3 Credit Hours
An intensive study of two or three authors, such as Dryden, Behn, Pope, Swift, Burney, Austen, or Samuel Johnson. Students cannot receive credit for both ENGL 420 and ENGL 520.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 421 Swingers. Flirts, & Libertines 3 Credit Hours
An examination of the functions that writers in English have assigned to literary decadence, libertinism, and aestheticism (or, the study of beauty and “art for art’s sake”). We will read writers who identified themselves as libertines as well as writers who represented libertines as we address the Restoration rake (Rochester & Behn), the Regency buck (the Shelleys & DeQuincey), the Victorian dandy (Oscar Wilde, Michael Field, & the Decadents), the modern playboy (Nin, Waugh & Fitzgerald), hippie-singer (Wolfe & Jagger), and finally, the postmodern player-celebrity (Bret Easton Ellis, Will Self & rock-lyricists).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 232 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 427 Jane Austen 3 Credit Hours
This course reads all six (6) of Jane Austen's major novels to 1) contextualize Austen's continued popularity within current debates about sexuality and marriage; and 2) study how the narrative arc of a female novelist's career responds to--and helps readers process--the revolutionary upheavals between late eighteenth- and early nineteenth-century Britain. Readings include Northanger Abbey, Sense & Sensibility, Pride & Prejudice, Mansfield Park, Emma, and Persuasion, and may also include Austen's juvenalia, unfinished work, and fiction by her precursors. (OC)

Restriction(s):
Cannot enroll if Class is Graduate

ENGL 441 Major 20C/21C English Authors 3 Credit Hours
An intensive study of several modern English authors, such as Shaw, Joyce, Forster, Dylan Thomas, D.H. Lawrence, and Woolf. Students cannot receive credit for both ENGL 441 and ENGL 541.

Restriction(s):
Cannot enroll if Class is Graduate

ENGL 442 Studies in 20-21 Century Lit 3 Credit Hours
Intensive study of a special topic in 20th- or 21st-century literature in English. The course may treat a single author (e.g. E.M. Forster), a movement (e.g. Postmodernism), a genre (e.g. modern short story), or a theme (e.g. Literature of World War).

Restriction(s):
Cannot enroll if Class is Graduate

ENGL 443 Anglo-Irish Literature 3 Credit Hours
A survey of Irish Literature written in English. Special emphasis will be given to Swift, Lady Gregory, Synge, Yeats, Joyce, and O?Casey, whose works will be examined in the context of Ireland?s unique history and culture.

Restriction(s):
Can enroll if Level is Undergraduate

ENGL 444 Sem in 20C/21C Poetry 3 Credit Hours
A seminar focusing on the poems of two or three English and/or American poets of the 20th- or 21st-century. Intensive discussion of individual poems, along with lectures on authors' critical and historical backgrounds.

Restriction(s):
Cannot enroll if Class is Graduate
ENGL 445 20C/21C Women Authors 3 Credit Hours
An analysis of selected works by significant and emerging 20th and 21st century women authors writing in English, with special emphasis on issues of gender and social and cultural identity.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 450 Maj Am Auth to the Civil War 3 Credit Hours
An intensive study of two or three authors, such as Charles Brockton Brown, Nathaniel Hawthorne, or Harriet Beecher Stowe, from the earlier periods of American Literature. Students cannot receive credit for both ENGL 450 and ENGL 550.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 451 Maj Am Auth to the Civil War 3 Credit Hours
An intensive study of two or three major authors from the period between the Civil War and World War I, such as Emily Dickinson, Charles Chesnutt, or Henry James. Students cannot receive credit for both ENGL 451 and ENGL 551.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 452 Maj 20C/21C American Authors 3 Credit Hours
An intensive study of several modern American authors, from the World War I to the present, such as Langston Hughes, Frost, Hemingway, and Faulkner. Students cannot receive credit for both ENGL 452 and ENGL 552.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 453 Contemporary American Novel 3 Credit Hours
Study of selected American novels and novelists since WWII with an eye to their social, political, and literary contexts. Course will focus on major works by major authors and representative works by lesser-known writers in order to explore technical, thematic and critical crosscurrents among the works. Students cannot receive credit for both ENGL 453 and ENGL 553.
Prerequisite(s): (COMP 106 or COMP 220 or Composition Placement Score with a score of 40 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 454 Postmodern Literature 3 Credit Hours
This course explores the expression of postmodernism in literature (primarily fiction) and critical theory. Selected works of fiction and creative non-fiction will be analyzed in terms of the problems and issues raised by the postmodern movement. Students cannot receive credit for both ENGL 454 and ENGL 554.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 455 Stud in 19th-Cent Amer Lit 3 Credit Hours
Close investigation of a special topic in 19th century American literature. The course may treat a single author (e.g. Whitman), a movement (e.g. transcendentalism), or a theme (e.g. utopianism, technology, or pragmatism), and may draw on work from other field of study.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 456 Modern English Grammar 3 Credit Hours
The morphological and syntactic analysis of the structure of present day English considered in the light of modern linguistic science. Students cannot receive credit for both ENGL 456 and ENGL 561.
Prerequisite(s): LING 280 or LING 281 or LING 480
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 461 Script-Writing Workshop 3 Credit Hours
This writing intensive course will train students to compose a film script, focusing on the substance, structure, and style of an original screenplay. The course will be conducted as a workshop in which students will first study classic scripts (and films based on these) of the film-school generation of directors, then model scenes and sequences of their own scripts on the principles of the above texts, and finally, write their own respective film stories in accordance with an appropriate narrative structure and design. (YR).

Prerequisite(s): JASS 310 or COMP 310 or ENGL 310 or COMM 310

ENGL 467 Writing Young Adult Fiction 3 Credit Hours
In this course participants will explore the young adult novel from the point-of-view of a reader and a writer. They will read recently published and critically acclaimed popular young adult novels. They will use these texts to explore such issues as gender, race and identity as they relate to young adult lives and their respective cultures generally. They will use these texts as models for the production of their own texts and will consider the constraints and benefits of constructing and writing to a particular audience. They will consider if and why young adult novels are abbreviated or limited in relationship to adult literature. In addition to reading about ten novels, they will complete several creative exercises leading up to a final portfolio. Students will not receive credit for both ENGL 467 and ENGL 568.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 223 or COMP 223)
Restriction(s):
Cannot enroll if Class is Graduate
ENGL 4705  Black Women / Lit, Film, Music  3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender and class have shaped the creative work of Black women. Students will be required to read, discuss, analyze and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash, and singer Billie Holliday.
Prerequisite(s): (FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303)

ENGL 471  LGBTQ Literature  3 Credit Hours
This course surveys primarily contemporary literature by writers who identify as gay, lesbian, bi-sexual, trans-gender, or queer. By studying the self-representation and culturally unique perspective of this emerging canon of writers, students in this course understand the emergence of LGBTQ literary traditions and understand the cultural diversity within these traditions. Students learn to identify the aesthetic qualities (such as camp, performativity, coded subtexts, homoeroticism, and the relationship between creativity and sexuality), and historical, political, and social concerns that characterize LGBTQ literary and cultural production. Topics covered include the struggle for civil rights before and after Stonewall, coming out narratives, the negotiation of homophobic cultures, postcolonial writers, and memoirs of the LGBTQ experience, as well as the historical emergence of sexual categories and the literary critique of heteronormativity. This course counts toward the English discipline diversity requirement. Students cannot receive credit for ENGL 471 and ENGL/WSGT 571.
Prerequisite(s): (ENGL 200 or ENGL 231 or ENGL 230 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239) and (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40)

ENGL 472  Reading in Multicult Contexts  3 Credit Hours
An examination of the effect of different cultural backgrounds on reading and literature. Topics include contrastive rhetoric, folk narrative, and multicultural juvenile literature. This course does not satisfy requirements for the English concentration. Not open to English concentrators. Students cannot receive credit for both ENGL 472 and ENGL 572.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 470  Composition  3 Credit Hours
An intensive study of major 20th-century African-American writers. Fiction, poetry, autobiography, and drama will be examined but one genre will be stressed in any given term, e.g., the novel. Lectures will provide historical and biographical context for analysis and discussion of the works. Students cannot receive credit for both ENGL 469 and ENGL 569.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 473  Arab American Women Writers  3 Credit Hours
Examines the literary and cultural contributions of Arab and Arab American women novelists, poets and artists to the development and consolidation of the cultures of understanding and coexistence; explores the tensions between citizenship and belonging, race and the politics of fears, gender and geographical mobility, and ethnic minorities and mainstream consciousness; discerns how Arab women writers and artists retell their various artistic endeavors to channel socio-political disenchantment, critique and civil disobedience; stresses how literary and artistic productions of a heterogeneous number of Arab American women writers and artists can indeed foster alternative visions of socio-cultural coexistence, dialogue and hospitality via artistic commitments to technical and stylistic experimentation and renovation. Students cannot receive credit for both ENGL 473 and ENGL 573. For graduate credit take ENGL 573.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239

ENGL 474  History of the English Lang  3 Credit Hours
A thorough grounding in the history and structure of the English language. At issue are the linguistic and ideological origins of the concept of Standard English, and the strengths and limitations of different methods of analyzing the history of the language. The course will emphasize sound change, grammatical change, and their sociological context. (YR)
Prerequisite(s): LING 280 or LING 480
Restriction(s):
Can enroll if Level is Undergraduate

ENGL 475  Queer Theory & Literature  3 Credit Hours
This course reads theories of sexuality to analyze how writers since 1600 have imagined printed text to reflect and shape desire, particularly same-sex desire. The course questions how same-sex desire appears in literature written before the theorization of “the Homosexual” in the late nineteenth century as well as how writers imagine sexuality before a hetero/homosexual binary appears. Writers may include contemporary theorists (Sedgwick, Foucault, Butler) as well as novelists (Gaskell and Stoker), playwrights (Kushner and Wycherley), and poets.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or AAAS 239)

ENGL 476  Monsters, Women & the Gothic  3 Credit Hours
This course questions our inheritance of “the gothic” as a district literary style that continues to discipline readers’ notions of gender and sexual identity. The course argues that by tracing the gothic’s literary history, we may simultaneously witness a history of gender formation. Readings may include English novelists who originated a gothic style in English (Walpole, Radcliffe, Lewis) as well as English and American poets and novelists who have debated as well as resisted the effects of the gothic on readers’ (particularly women’s) psychology (Christina Rossetti, Austen, King, Stoker).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
ENGL 488  Env Lit & Reps of Nature  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between "nature" and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th centuries, but assigned materials may include readings from other cultures and historical periods.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 490  Advanced Topics in English  3 Credit Hours
Examination of advanced problems and issues in selected areas of English studies. Title as listed in the Schedule of Classes will change according to content. May be repeated for credit when specific topics differ.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

English Composition (COMP)

COMP 095  Engl Second Language I  3 Credit Hours
An alternative to COMP 099. Specifically designed to address the needs of students for whom English is a second language and who are not yet proficient in English. Offers intensive practice in basic English grammar and rhetoric through the writing of short papers and the reading and discussion of appropriate texts. Focuses on the conventions of written English. (OC).

COMP 099  Writing Techniques  3 Credit Hours
Course is designed to help the less-prepared student qualify for COMP 105 by providing a review of basic grammar and syntax and frequent practice in writing short papers to develop habits of unified, coherent, and correct composition. Student writing is complemented by the reading and analysis of short prose pieces selected to help students read for understanding and to learn more about writing through the study of professional authors. Must be taken by students who do not qualify for COMP 105. (FW).

COMP 105  Writing & Rhetoric I  3 Credit Hours
Comp 105: Focuses on the study and practice of writing and rhetoric, with special emphasis on the writing process. Students write and read critically a range of texts, and consider academic and nonacademic genres and conventions. (FW).
Prerequisite(s): COMP 099 or Composition Placement Score with a score of 20

COMP 106  Writing & Rhetoric II  3 Credit Hours
Focuses on the study of writing and rhetoric through composing a range of researched texts. Students study the rhetorical choices effective for writing in different media, and learn practical strategies for academic inquiry and for giving useful feedback in response to the writing of others. Such strategies include those related to the use of electronic and print resources, peer-review and revision. Credit may only be given toward degree one time for COMP 106, 220 270, or 280, as they are "equivalents".
Prerequisite(s): COMP 105 or Composition Placement Score with a score of 30 or COMP 110

COMP 110  Honors Writing & Rhetoric I  3 Credit Hours
Honors Program introductory composition course. Fulfills the Composition I requirement for students in the Honors Program. Course focuses on college-level expository writing techniques through seminar-type analysis of texts read in the Honors Program and through individualized and group writing workshops. Assignments include at least five finished papers incorporating revision. Honors students, like other students in first-semester composition, must pass the standard exit exam for COMP 105 to continue on to COMP 220 (or COMP 106). (F).
Restriction(s):
Can enroll if Attribute is Honors Program

COMP 220  Honors Writing & Rhetoric II  3 Credit Hours
Honors Composition fulfills the Composition II requirement for students in the Honors Program. It is designed to develop research, writing, and editing skills and to give the student experience in argumentation and persuasion and in the interpretation of literary texts. Satisfies for honors students the 200-level prerequisite for upper-division English courses, except for English concentrators. Credit may only be given toward degree one time for Comp 106, 220, 270, or 280, as they are "equivalent" courses. (YR)
Prerequisite(s): COMP 110 or Composition Placement Score with a score of 30 or COMP 105

COMP 223  Intro to Creative Writing  3 Credit Hours
An introduction to the writing of poetry, the short story, and/or the play. Considerable writing analysis, criticism, and discussion. (FW).
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMP 227  Intermed Expo and Arg  3 Credit Hours
Further explorations in exposition and argumentation to develop and enhance the student's ability to write essays and/or articles. Review of basics of grammar and style. Intensive practice in writing and careful examinations of appropriate books and shorter prose works. Written assignments of 500 to 2000 words. (FW).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 267  Arab & Arab American Workshop  3 Credit Hours
The Arab and Arab American Writers Workshop is a creative writing workshop focusing on poetry and fiction. Students will explore Arab American literature, writers, and themes. Students are expected to work on their own manuscripts as well as critique outside readings. The workshop will be conducted under the guidance of Arab and Arab American faculty and is open to all students.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
COMP 280 Business Writing & Rhetoric 3 Credit Hours  
Instruction and practice in designing technical reports. Students study the rhetorical problems facing the professional engineer in industry and learn practical strategies for analyzing and communicating technical information to both technical and non-technical audiences. Topics include audience analysis, technical research methods, report formats (written and oral, formal and informal), argumentation and persuasion, editing. This course fulfills the Composition II requirement for engineering students only. Credit may only be given toward degree one time for Comp 106, 220, 270, or 280, as they are "equivalent" courses. (FW)  
Prerequisite(s): COMP 105 or Composition Placement Score with a score of 30 or COMP 110  
Restriction(s):  
Can enroll if Class is Sophomore or Junior or Senior  
Can enroll if College is Engineering and Computer Science

COMP 270 Tech Writing for Engineers 3 Credit Hours  
Instruction and practice in designing technical reports. Students study the rhetorical problems facing the professional engineer in industry and learn practical strategies for analyzing and communicating technical information to both technical and non-technical audiences. Topics include audience analysis, technical research methods, report formats (written and oral, formal and informal), argumentation and persuasion, editing. This course fulfills the Composition II requirement for engineering students only. Credit may only be given toward degree one time for Comp 106, 220, 270, or 280, as they are "equivalent" courses. (FW)  
Prerequisite(s): COMP 105 or Composition Placement Score with a score of 40 or COMP 280

COMP 280 Business Writing & Rhetoric 3 Credit Hours  
Instruction and practice in designing technical reports. Students study the rhetorical problems facing the professional engineer in industry and learn practical strategies for analyzing and communicating technical information to both technical and non-technical audiences. Topics include audience analysis, technical research methods, report formats (written and oral, formal and informal), argumentation and persuasion, editing. This course fulfills the Composition II requirement for engineering students only. Credit may only be given toward degree one time for Comp 106, 220, 270, or 280, as they are "equivalent" courses. (FW)  
Prerequisite(s): COMP 105 or Composition Placement Score with a score of 30 or COMP 110  
Restriction(s):  
Can enroll if Major is Prebusiness, Public Health, Community Health Education

COMP 300 Writing Studio 1 Credit Hour  
Concurrent registration in a first-year writing course or an upper-level writing-intensive course required. Writing Studio is a one-credit-hour workshop that provides small-group, student-centered advice on all phases of the writing process, from composing to revising and editing. Special attention given to rhetorical considerations like adapting to audience expectations and critically considering discipline-specific conventions. Focus on drafts-in-progress students are writing concurrently in their Dearborn Discovery Core classes. (FW,S,YR)

COMP 310 Narrative Journalism 3 Credit Hours  
Students learn to identify, understand and use the techniques of fiction in the service of nonfiction material. While studying the texts as literature, students are also encouraged to view them as models for writing. Assignments include the writing and revising of articles, based on research and interviews, and writing in story form, drawing on literary techniques. (YR).  
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 327 Advanced Exposition 3 Credit Hours  
A study of rhetorical theory and its application to various types of expository essays. Writing assignments will reflect the types of essays studied. May be repeated to a maximum of 6 credit hours.  
Prerequisite(s): COMP 106 or COMP 270 or COMP 220 or Composition Placement Score with a score of 40 or COMP 280

COMP 331 Online Reporting, Research, Writing 3 Credit Hours  
Course introduces the technical, social, legal and ethical practice of online research, focusing specifically on reporting (i.e. research and interview) skills required by journalists and others. Students use new media technology to generate ideas, to research subjects, and to develop general-audience writing projects in their areas of interest. Course covers the use of Web search engines, directories and databases; finding sources and interviewing people online; evaluating the credibility of online sources and information; using Lexis-Nexis to access archives and public records; and using spreadsheet and database programs.  
Prerequisite(s): COMP 106 or COMP 110 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 341 Writing in the Professions 3 Credit Hours  
This course involves students in an examination of rhetoric and argumentation in professional and workplace settings. This course introduces relevant theories of cultural and linguistic analysis, including genre analysis. Comp 341 includes an extended research project focused on writing in professional or workplace settings. (AY)  
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMP 364 Writing for Civic Literacy 3 Credit Hours  
In Writing for Civic Literacy, students will study how politicians, the media and critical citizens use language to engage with the broader community. Students themselves will learn to use language to become more active, well-informed citizens. They will study rhetorical awareness, audience analysis and persuasive writing techniques and put those lessons to use in community settings. They will perform community service at agencies of their choosing and use those experiences as objects of analysis, researching the social context in which those agencies operate and writing analytically about the agencies. Further, students will synthesize classroom lessons and real-world experience by executing writing tasks for and with the agencies (these tasks might include editorials for the local press, informational webpages and fundraising materials).  
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 390 Topics in Composition 3 Credit Hours  
Examination of problems and issues in selected areas of rhetoric and composition. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs. (OC).  
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 399 Independent Study 1 to 3 Credit Hours  
A significant writing project in non-fiction or fiction prose developed in accordance with the needs and interest of those enrolled and agreed upon by the instructor. Participants may also study texts of published authors. May be repeated for a maximum of 6 credit hours.  
Restriction(s):  
Can enroll if Level is Undergraduate
COMP 436  Memoir and Travel Writing  3 Credit Hours  
A course in narrative non-fiction that focuses on memoir and travel writing. Reading involves several books as well as classic essay-length examples. Assignments include both short analytical papers and the writing and revising of three original articles, based on research, interviews, memory, and observation, and drawing on literary techniques. (YR)  
**Prerequisite(s):** COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280  
**Restriction(s):**  
Cannot enroll if Level is Undergraduate

COMP 462  Transnational Rhetorics  3 Credit Hours  
Full Course Title: Transnational Rhetorics: Writing Across Borders  
"Transnational Rhetorics" engages students in reading and writing texts that transgress various kinds of borders. These borders might be national, as in stories about immigration or displacement. Or, the borders might be more abstract, like the assumed borders between race, class, and gender, or even the possible barriers we perceive between personal experience and world events. In this course, we will read texts about people who reflect on these kinds of border-crossings. We will then take a rhetorical approach to these narratives and examine how they work, what similarities they share, and importantly, how they address different audiences. We will then produce—-in turn—our own border-crossing essays that attend to the same issues of audience, context, narrative, and creativity. (OC)  
**Prerequisite(s):** COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMP 464  Contemporary Rhetorical Theory  3 Credit Hours  
An examination of contemporary rhetorical theories through study of representative practitioners and related developments in linguistics, philosophy, psychology, communication, and composition and rhetoric. Students may not receive credit for both COMP 464 and COMP 564.  
**Prerequisite(s):** COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 466  Arguing Feminism: Rhetoric  3 Credit Hours  
An introduction to the work of major twentieth century feminists working in rhetoric and related fields. Students examine recurring themes of language, meaning, ethics and ideology, and practical strategies which address rhetorical and ethical concerns central to feminist/academic writing.  
**Prerequisite(s):** COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMP 468  Read/Writ Young Adult Fiction  3 Credit Hours  
In this course participants will explore the young adult novel from the point-of-view of a reader and a writer. They will read recently published and critically acclaimed popular young adult novels. They will use these texts to explore such issues as gender, race and identity as they relate to young adult lives and their respective cultures generally. They will use these texts as models for the production of their own texts and will consider if and why young adult novels are abbreviated or limited in relationship to adult literature. In addition to reading about ten novels, they will complete several creative exercises leading up to a final portfolio.  
**Prerequisite(s):** COMP 106 and (ENGL 223 or COMP 223)  
**Restriction(s):**  
Cannot enroll if Class is Graduate

COMP 475  Supporting Literacies  3 Credit Hours  
COMP 475 will help prepare advanced undergraduate students to be successful as writing tutors and/or as supporters of literacy development in diverse higher education and community contexts (work in university writing centers, community literacy organizations, service learning courses, etc.) through sustained focus on the theoretical and practical issues involved in the teaching and tutoring of writing. The course also will help students make explicit connections between the teaching and learning of writing in various college classroom contexts (i.e., writing-across-the-curriculum) and other sites of literacy work. A range of writing projects will provide students with opportunities also to hone their own abilities as reflective and critical writers. (AY)  
**Prerequisite(s):** COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMP 485  How Writing Works  3 Credit Hours  
In this course we will investigate why and how people write for particular audiences and in a variety of contexts. Subjects will include: cognitive and social theories of writing and the writing process, theories of persuasion, writing across the curriculum, writing for multiple audiences, writing in the workplace, writing for self and for publics, and teaching writing. The course will be useful to students interested in teaching writing at the K-12 level, those interested in careers in communication and those who wish to better understand how writing promotes personal and societal change. (YR)  
**Prerequisite(s):** COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:  
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Entrepreneurship (ENT)**

ENT 400  Entrepreneurial Thinking&Behav  3 Credit Hours  
This course introduces entrepreneurship as an approach to one’s life and career advancement. It explores how entrepreneurial thought can create change and opportunities in many organizations, including large corporations, small business, and communities. The course will focus on how the entrepreneurial mindset is a toolkit that can be taught and how entrepreneurial skills empower individuals to bring about change. Students will be challenged to push the boundaries to identify unmet customer needs that are demanded by various demographics. Important aspects of the course include a careful analysis of the following: opportunity recognition, design thinking, market assessment, effective communication, operational partners, strategic management, and financial planning. Students will be exposed to resources from urban areas including speakers with experience and expertise in the entrepreneurial community.  
**Restriction(s):**  
Can enroll if Class is Junior or Senior
ENT 401 New Venture Planning  3 Credit Hours
Full Title: New Venture Planning and Entrepreneurial Processes. This course focuses on the research, planning, and strategies that are critical in the process of pursuing a new venture. Particular focus will be given to the business model and key resources to support the early stages of both large and small ventures. The business model canvas will be used to understand how a venture creates, delivers, and captures value. Students will critically analyze businesses, products, and services and, in a team, they will create their own plan to implement a venture. (YR)
Prerequisite(s): ENT 400

ENT 402 Entrep, Corp Entrep & Society  3 Credit Hours
Full Title: Entrepreneurship, Corporate Entrepreneurship, and Society. Students in this course examine entrepreneurship from historical, philosophical, economic, and sociological lenses. The course helps students understand the origins of the field and the role of entrepreneurship in the allocation and distribution of scarce resources for wealth and prosperity in society. From this foundation, students examine entrepreneurship’s influence on contemporary world issues. The course finishes by examining how different types of entrepreneurship opportunities (i.e., types of business being pursued) result in fundamentally different organizational structures, each with unique requirements for entrepreneurial success. (YR)
Prerequisite(s): ENT 400

ENT 403 Social Entrepreneurship  3 Credit Hours
The purpose of this course is to expose students to social entrepreneurship concepts and theories to help them learn how community leadership can facilitate the social entrepreneurship process for positive community change (i.e. social impact). This experiential learning course is designed for students who wish to integrate entrepreneurial problem-solving skills with strategic social innovation concepts to affect positive social change in underserved communities. This course appeals to students who have a strong desire to become, advise, or support social entrepreneurs, or work in a start-up, early stage, or entrepreneurial-minded company or community organization that creates positive social impact using a for-profit business model. Note that this is an academic service-learning (ASL) course, where students will interact with entrepreneurs and organizations in the community to develop a comprehensive business plan to address a pressing social problem. (YR)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
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Environmental Science (ESCI)

ESCI 301 Environmental Science  4 Credit Hours
A survey of historical and current environmental problems, with emphasis on understanding causes, consequences, and control. Topics include human population growth, air pollution, water pollution, and waste disposal. Laboratory emphasizes an experimental approach to environmental problems, including data collection, analysis, and interpretation. Lecture and laboratory/recitation.
Prerequisite(s): CHEM 124 or CHEM 134 or CHEM 144 and GEOL 118 and BIOL 130

ESCI 304 Ecology  4 Credit Hours
Relationships between organisms and their environments. Patterns in the physical environment, physiological and behavioral adaptations, population dynamics, energy flow, nutrient cycling; succession. Three hours lecture, four hours laboratory (with field trips). (F).
Prerequisite(s): BIOL 130 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 116)
Corequisite(s): ESCI 304L

ESCI 305 Intro to GIS 4 Credit Hours
An introductory course that examines the digital representation, manipulation, and analysis of geographic data, with emphasis on the analytical capabilities that GIS brings solutions to geographic problems. Students will explore and learn GIS principles using ESRI's mapping software, as well as complete a major GIS project.
Prerequisite(s): GEOG 302
Corequisite(s): ESCI 305L

ESCI 305D Intro to GIS & Cartography Dis 0 Credit Hours
Required discussion session for ESCI 305.
Corequisite(s): ESCI 305

ESCI 315 Aquatic Ecosystems  4 Credit Hours
An introduction to the physical, chemical, and biological characteristics of lakes, rivers, and wetlands emphasizing a comparison of ecosystem structure and function. Laboratory emphasizes data collection and analysis to characterize a representative lake, river, and wetland. Lecture and laboratory. (AY,F).
Prerequisite(s): BIOL 130 and (CHEM 124 or GEOL 118)

ESCI 320 Field Biology  4 Credit Hours
Adaptations, taxonomy, systematics, ecology, and behavior of southeastern Michigan flora and fauna. Techniques of field observation and recording are emphasized. Skills in the use of identification keys and guides are developed. The campus Environmental Study Area is used intensively. Three hours lecture, four hours laboratory (with field trips). (S).
Prerequisite(s): NSCI 120 or NSCI 233

ESCI 330 Land Use Planning and Mgmt  4 Credit Hours
Environmental aspects of land use planning, park planning, and site planning. Consideration of soils, groundwater, topography, and sensitive natural features and their role in determining land-use suitability. Examination of the mechanics and effectiveness of the planning process. Lecture and recitation. (AY,W).
Prerequisite(s): (BIOL 130 and GEOL 118) or ESCI 275

ESCI 332 Hazardous Waste Management  3 Credit Hours
Environmental problems associated with solid and hazardous waste. Regulations governing the generation, transport, and disposal of hazardous waste. Waste management techniques, including reduction, reuse, recycling, treatment, incineration, and land disposal. Three hours lecture. (AY,W).
Prerequisite(s): GEOL 118 or ESCI 275
ESCI 337  Plant Ecology  3 Credit Hours
This course focuses on different aspects of the relationship between plants and their environment. Topics include: a) interactions of plants with the physical environment; b) ways in which the environment acts to shape plant populations through evolution; c) intra- and interspecific interactions among individuals; and d) large-scale patterns and processes at the landscape-level. Three hours lecture.
Prerequisite(s): BIOL 130

ESCI 348 Environmental Chemistry  3 Credit Hours
Description of the concepts, principles, practices, and current problems in the chemistry of natural waters, the soil, and the atmosphere. Three hours lecture. (AY,W).
Prerequisite(s): CHEM 344 and (CHEM 225 or CHEM 325)

ESCI 349  Environmental Chemistry Lab  1 Credit Hour
Collection and analysis of air, water, soil, and organisms for pollutants such as noxious gases, heavy metals, and trace organics. EPA-approved methods are emphasized. Four hours laboratory. (AY,W).
Prerequisite(s): ESCI 348* or CHEM 348*

ESCI 352 Introduction to Toxicology  3 Credit Hours
An introduction to the principles of toxicology with an emphasis on environmental toxicology. Major topics include toxic agents, toxicological mechanisms, and use of toxicological reference literature. Discussion of chemical carcinogenesis, genetic toxicology, immunotoxicology, teratology, and toxic responses of the skin, eyes and nervous system. Three hours lecture. (AY,W).
Prerequisite(s): CHEM 225

ESCI 370 Environmental Geology  3 Credit Hours
Interactions between people and the physical environment. Geological hazards and natural processes, such as earthquakes, volcanism, floods, landslides, and coastal processes. Relationships between geology and environmental health, including chronic disease, water use and pollution, waste disposal, mineral resources, and energy use. Three hours lecture. (AY).
Prerequisite(s): GEOL 118

ESCI 372Energy Resources  3 Credit Hours
Origin and development of fossil fuels (petroleum, coal, natural gas) and of radioactive ores used in nuclear power. Renewable and alternative energy sources, including hydro, solar, wind, biomass, and geothermal power. Environmental impacts of energy use. Three hours lecture. (OC).
Prerequisite(s): GEOL 118 or ESCI 275 or ESCI 301

ESCI 375 Groundwater Hydrology  4 Credit Hours
Prerequisite(s): GEOL 118

ESCI 390 Topics in Environmental Sci  1 to 3 Credit Hours
A course in special topics current to environmental science. Topics and format may vary. See current Schedule of Classes.

ESCI 395 Sem on Environmental Issues  1 Credit Hour
Readings, discussions, and presentations which examine current environmental issues. One hour seminar. Permission of instructor. (FW).

ESCI 414  Limnology  4 Credit Hours
The study of the structural and functional relationships and productivity of organisms in lakes and streams as they are regulated by their physical, chemical and biotic environments. Laboratories will emphasize field study of area lakes and streams. Three hours lecture, four hours laboratory. BIOL/ESCI 304 or ESCI 275 recommended.
Prerequisite(s): BIOL 130 and (CHEM 136 or CHEM 146)
Corequisite(s): ESCI 414L

ESCI 416 Stream Ecology  4 Credit Hours
A study of the physical, chemical and biological characteristics of streams and rivers. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304

ESCI 420 Advanced Field Ecology  4 Credit Hours
An intense study of behavioral ecology and field-oriented research at an advanced level, utilizing ecological habitats on campus and in surrounding urban areas. Focus will be on plant/animal interactions and will include pollination ecology, reproduction and distribution ecology, optimal foraging theory, as well as hypothesis testing of animal migration and distribution of species in extreme urban environments. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304 or BIOL 320 or ESCI 320
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

ESCI 422 Conservation Biology  3 Credit Hours
This course is a study of the historical and current preservation of global biodiversity. The value of biodiversity, extinction, threats to biodiversity, and both ex situ and in situ conservation strategies are considered. (F; AY)
Prerequisite(s): BIOL 304 or ESCI 304
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

ESCI 485 Spatial Analysis  3 Credit Hours
Full Title: Spatial Analysis and the Environment The statistical methods behind analyzing spatial datasets is covered in detail, with a strong emphasis on environmental sciences and human populations. This course complements courses in remote sensing, geographic information systems, and geographic principles and is designed to quantitatively evaluate the relationships between objects and their surroundings. (S)
Prerequisite(s): GEOL 305 or ESCI 305 or GEOL 340 or ENST 340 or GEOG 302 or GEOG 202 or GEOG 305
Restriction(s):
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

ESCI 490 Topics in Environmental Sci  1 to 3 Credit Hours
A course in special topics of current interest in environmental science. Topics and course format may vary; see current Schedule of Classes for availability. (OC)
Environmental Studies (ENST)

ENST 201  Cultural Geography  3 Credit Hours
Overview of the major components of culture such as language, religion, agriculture, settlement patterns, and related landscape features in a spatial context. Emphasis on how various cultures perceive and interact with the environment. (F).

ENST 203  Weather and Climate  3 Credit Hours
The controls and conditions of Earth's weather and climate including atmospheric circulation, precipitation processes, severe weather, climatic regions, and climatic change. (F).

ENST 204  Landforms  3 Credit Hours
Processes and agents that shape the landscapes and landforms of the Earth's surface. The discussion of landforms is divided into two parts: (1) constructive processes and their spatial distribution and (2) gradational processes and their spatial distribution. (W).

ENST 300  Urban Geography  3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges such as sprawl, pollution, congestion, crime, poverty, etc., are addressed. (W).

ENST 301  Concepts of Environmentalism  3 Credit Hours
Designed to identify the underlying concepts of any environmental issue. The course will demonstrate the interdisciplinary nature of environmental problems solving through current readings, classical monographs and films. Students will conduct a system analysis of a household and a local community. This course will not be open to students who take ENST 105. (W).

ENST 305  Env Instrumentation and Analys  3 Credit Hours
This course will survey the parameters which must be measured in order to properly assess the environment. Methods for the analysis of the biophysical as well as the social, psychological, and political environment will be studied. (W).

ENST 310  Economic Geography  3 Credit Hours
Spatial aspects of the ways people make their living. Discussion of the spatial distribution of resources and wealth at various scales. Introduction of site selection and location analysis. (W).

ENST 311  Environmental Ethics  3 Credit Hours
The relationship of human beings to the non-human environment raises pressing moral and political issues. This course will use the theories and concepts of philosophical ethics to explore such questions as human obligations to non-human animals; the preservation of wilderness; balancing economic, aesthetic, and spiritual values; and the problems of pollution, urban sprawl, and ecological justice. (F, YR).

ENST 320  Global Climate Change  3 Credit Hours
This course explores concepts and current thinking on global climate change and environmental impacts. It covers the history of Earth's climate, causes of climate change and current research attempting to forecast change. The biotic, economic, and social implications of climate change are discussed. (AY)

ENST 325  Environmental Politics  3 Credit Hours
This course will examine the process of policy making on environmental and energy problems at the global level, at the national level, and at the local level. (AY).

ESCI 490A  Topics in Environmental Sci  3 Credit Hours
Topic: Conservation Biology. A scientific study of the concept of conservation biology, including its ecological, economic, ethical, and cultural components. Lectures, assigned readings, and class discussions will explore the major threats to biodiversity, the complexities of conservation issues, and the tools, strategies, and techniques conservation biologists use to implement policies for the protection and preservation of ecosystems from local to global and short-to-long term scales.

Prerequisite(s): BIOL 130

Restriction(s): Can enroll if Class is Junior or Senior

ESCI 490B  Sustainable Cities  3 Credit Hours
Topic Title: Sustainable Cities: In 2007, for the first time in human history, the world became an urban one with more than 50 percent of its population living in cities. The unseen influx of people into cities socio-ecological challenges of increasing scale. This course is a discussion of sustainability and resilience efforts (solution-focused) in cities around the world and follows a multi-disciplinary approach by integrating urban-focused concepts from history, sociology, ecology, geography, and architecture and planning. Topics include, for example, air pollution and climate change, sprawl and smart growth, alternative energy, public transportation, waste management, water management, green architecture, environmental and social (in)justice, cultural diversity, and forestry and farming. (OC).

ESCI 492  Capstone Research Experience  3 Credit Hours
An approved research experience with a full-time Environmental Science faculty member. Research results are reported in a seminar presentation and in a poster, thesis, or a manuscript submitted for publication. (F, W, S)

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior

ESCI 497  Seminar in Environmental Sci.  1 Credit Hour
Readings, discussion, and presentation of research in selected areas of study. One hour seminar. Permission of instructor. (OC).

ESCI 498  Indep Study in Environ Sci  1 to 3 Credit Hours
Library research and independent study performed under the guidance of a faculty member. Four to twelve hours readings. Permission of instructor. (F,W,S).

ESCI 499  Lab Research in Environ Sci  1 to 3 Credit Hours
Directed laboratory or field research performed under the guidance of a faculty member. Four to twelve hours laboratory. Permission of instructor. (F,W,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally.
ENST 326  Anth of Health and Environment  3 Credit Hours
Cultural conflicts over pollution, disease etiology, development and natural resources often originate and are played out in local ecosystems. Anthropologists are increasingly becoming involved as researchers, developers, and activists in these cultural strifes. This course reviews the work of environmental and medical anthropologists as well as other critical scholars who unravel the values, meanings and ideologies associated with ecological issues in given localities. Drawing on theoretical advances in critical medical anthropology, environmental anthropology and applied anthropology, the course seeks to improve the knowledge and abilities of student anthropologists in their environmental health work.

ENST 327  Michigan Geography  3 Credit Hours
A geographic study of the landforms, waterways, natural resources, landmarks and economic activities that contribute to the physical and cultural landscapes of Michigan. Population, industry, agriculture, recreation and tourism will all be considered. (WS,YR)

ENST 330  Land Use Planning and Mgmt  4 Credit Hours
Environmental aspects of land use planning, park planning, and site planning. Consideration of soils, groundwater, topography, and sensitive natural features and their role in determining land-use suitability. Examination of the mechanics and effectiveness of the planning process. Lecture and recitation. (AY).
Prerequisite(s): ESCI 275 or (BIOL 130 and GEOL 118)

ENST 340  Remote Sensing  3 Credit Hours
This course explores the acquisition, processing, and visualization of remotely derived data, with a particular emphasis on local and environmental applications. ENST 340 covers concepts and foundations of aerial and orbital remote sensing, visual interpretation, reflectance and emission spectroscopy, active and passive sensors, topography, and digital image processing software and techniques.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ENST 351  Environmental Economics  3 Credit Hours
This course examines the economic aspects of pollution problems. Topics covered include the economic theory of externalities, the theory of the commons, the theory of public goods, and the optimum use of depletable natural resources. The role of cost-benefit analysis as an intricate part of the decision-making process will also be thoroughly examined. (AY).
Prerequisite(s): ECON 202

ENST 365  Environmental Psychology  3 Credit Hours
A survey of the contributions of the behavioral sciences to the understanding and solution of environmental problems that threaten our survival. Insights derived from psychology, anthropology, and computer sciences are discussed. Major topics include overpopulation, overconsumption, “future shock,” cognitive limitations in our understanding of ecological-political systems, and the use of Skinnerian behavior control. (AY).
Prerequisite(s): PSYC 170 or PSYC 171

ENST 385  Environmental Internship  1 to 9 Credit Hours
A field assignment relating to the student’s environmental interests. The student will work in an off-campus government or private business for a prescribed number of hours each week to be arranged by the advisor and employer. May be repeated up to three times. Written permission of instructor.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ENST 390  Topics in Environmental Stds  1 to 9 Credit Hours
Examination of problems and issues in selected areas of environmental studies. Title listed in the Schedule of Classes will change according to the content. Course may be repeated for credit when specific topics differ.

ENST 395  Sem on Environmental Issues  1 Credit Hour
Readings, discussions, and presentations which examine current environmental issues. One hour seminar. Written permission of instructor. (YR).

ENST 436  Human Ecology  3 Credit Hours
Deals with the forms and modes of change of social structure and culture, as affected by interactions with environment, population, and technology. Emphasis is given to territorially based social structures.

ENST 445  Environmental Law  3 Credit Hours
A survey of common law theories and analysis of environmental statutes from a functional perspective. The course also includes environmental law aspects of constitutional law, administrative law and criminal law, as well as the public trust doctrine and public lands. Student cannot receive credit for both ENST 350 and ENST/POL 445.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

ENST 456  Ecological Economics  3 Credit Hours
A review of major theories and issues concerning the relationship between ecological and economic systems. Topics include these questions: What is the purpose of economics activity? How important is the preservation of the natural world compared to the production of economic goods? How do principles of social and intergenerational equity affect the use of resources and choice of goods to be produced? The course utilizes a transdisciplinary approach in the development of new models where conventional economics and ecology alone have been ineffective in addressing questions of sustainability and equity. (AY).
Prerequisite(s): (ECON 201* or ECON 202*) and ENST 301*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ENST 467  Food Politics and Policy  3 Credit Hours
How do politics affect our food at the global, national, and urban/local scale? This course examines close historical relationships between politics and food; the politics of conventional agriculture and food policy; and alternative agricultural movements and food systems, with a particular emphasis on urban food policy and urban food systems. (AY)

ENST 474  Environmental Education  2 to 3 Credit Hours
An analysis of environmental education at elementary and secondary levels, particularly stressing the environment as a teaching resource. Community resources as they relate to environmental education are also investigated. (AY).

ENST 483  Justice, Crime and Environment  3 Credit Hours
This service-learning course focuses on environmental justice and law. Environmental Justice is defined as the fair treatment of all people with respect to the development, implementation, and enforcement of environmental laws. In the classroom, students learn the theory, history, and enforcement of environmental laws and regulations in Detroit, Michigan, and nationwide. In a required civic engagement project, students apply their substantive knowledge to solve local environmental problems. Through classroom learning and projects with community organizations, students connect law and justice concerns to Detroit’s environmental problems.
Restriction(s):
Can enroll if Class is Junior or Senior
ENST 485  Seminar in Environ Topics  2 Credit Hours
A seminar course taken during the student’s senior year to provide an opportunity for students with diverse environmental interests to interact and synthesize the information and skills acquired during their previous studies. (W).

ENST 486  Environmental Interpretation  2 to 3 Credit Hours
Course deals with the interpretation of the environment, its characteristics, and its presentation to school groups as well as to the general public. Intended to acquaint students with a variety of skills and techniques necessary for interpreting the environment to others. Extensive use is made of the UM-Dearborn Environmental Study Area. (AY).

ENST 487  Comparative Enviro Policy  3 Credit Hours
This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages—from defining an issue as an environmental problem to placing it on political agenda and then receiving a response at domestic governmental or international levels. This course analyzes environmental issues from a cross-cultural and comparative perspective, with a particular attention given to political institutions, political change, levels of development, political culture, public participation, and international commitments that shape the nature and dynamics of environmental politics and policy in different countries.

Restriction(s):
Can enroll if Class is Junior or Senior

ENST 488  Env Lit & Reps of Nature  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between “nature” and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th centuries, but assigned materials may include readings from other cultures and historical periods.

Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENST 490  Dir Research in Envir Studies  1 to 6 Credit Hours
This course will provide students with an opportunity to conduct an independent research investigation on topics in environmental studies under the direction of various faculty members. The results will be presented in a paper and public seminar. May be repeated.

ENST 491  Topics in Environmental St  3 Credit Hours
The examination of problems and issues in selected areas of environmental studies. The title listed in the Schedule of Classes will change according to the content. The course may be repeated for credit when the specific topic differs. Also offered for graduate credit. (OC).

ENST 491B  Topics in Environmental Studies  3 Credit Hours
TOPIC: Comparative Environmental Policy. This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages—from defining an issue as an environmental problem to placing it on political agendas and then receiving a response at domestic governmental or international levels. This course will analyze various levels at which environmental issues occur and are being addressed politically.

ENST 491C  Sustainable Cities  3 Credit Hours
In 2007, for the first time in human history, the world became an urban one with more than 50 percent of its population living in cities. The unseen influx of people into cities presents socio-ecological challenges of increasing scale. This course is a discussion of sustainability and resilience efforts (solutions-focused) in cities around the follows a multi-disciplinary approach by integrating urban-focused concepts from history, sociology, ecology, geography, and architecture and planning. Topic include, for example, air pollution and climate change, sprawl and smart growth, alternative energy, public transportation, waste management, water management, green architecture, environmental and social (in)justice, cultural diversity, and forestry and farming.

ENST 497  Seminar in Environmental Sci  1 Credit Hour
Readings, discussions and presentation of research in selected areas of study. One hour seminar.

ENST 498  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. Permission of instructor.

ENST 499  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. Permission of instructor.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
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Exploratory Studies (EXPS)

EXPS 218  Topics in Exploratory Studies  1 to 3 Credit Hours
An examination, at the freshman and sophomore level, in the selected areas of general study. The title as listed in the Schedule of Classes may change according to content. Course may be repeated for credit when specific topics differ.

EXPS 220  Science in the Elem School  2 to 3 Credit Hours
This course is designed for people intending to become elementary school teachers and who have had little or no previous experience in science. The course utilizes a laboratory approach to the study of the concepts, processes, and value of elementary and middle school science.

EXPS 250  Elem Ed Vis & Perf Arts  3 Credit Hours
This course will teach the elementary education student how to incorporate the various visual and performing arts into everyday elementary education curricula. The course will cover the fundamental and formal elements, the major periods, styles and philosophies, as well as the functions and processes of the visual and performing arts, and how to effectively employ those creative processes through collaboration, communication, cooperation and interaction in the elementary classroom.

Restriction(s):
Can enroll if Level is Undergraduate
EXPS 270  Inclusion & Cultural Immersion  1 Credit Hour
The seminar is modeled after New Detroit’s Multicultural Leadership Series. The format offers a highly innovative approach to building competences to address (ethnic, racial, gender, and sexual orientation) topics relevant to the metropolitan Detroit region. Students attend off-campus sessions where they spend the day immersed in that culture. Each session offers an in-depth look at (but not limited to) the history, culture, and socioeconomic issues that are germane but also transcend regional barriers. Goals of the course: 1) Bridge communication gaps; promote better understanding and appreciation among all people. 2) Develop a greater understanding of the distinctive and subtle differences within our community. 3) Explore various tools to enhance communication and collaborations geared towards closing our regional divide.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

EXPS 282  History & Civics Elem Schools  3 Credit Hours
A survey of Michigan and United States history and government through Reconstruction. U.S. historical and political topics taught in grades K-8 are explored. Students also examine families, schools, and local communities.
Restriction(s):
Can enroll if Level is Undergraduate

EXPS 283  Geography & Econ Elem Schools  3 Credit Hours
A survey of the geography and economics taught in grades K-6. Particular attention will be paid to the geography of Michigan and the Great Lakes region. Market and other types of economics will be examined in the light of core economic principles. (F,W,S)
Restriction(s):
Can enroll if Level is Undergraduate

EXPS 298  Exp Writing-Comm Learn&Tch  3 Credit Hours
This course provides a theoretical foundation for using writing to communicate and learn for personal and professional purposes. Emphasis will be placed on learning effective instructional strategies including modeling, using mentor text (high-quality writing examples to emulate), conferencing with others about one’s writing, and peer- and self-assessing writing to support all writers’ development. For the first half of the course, students will focus on developing their own writing skills using the writing process with three genres (narrative, informational/explanatory, and argumentative). Additional application of course knowledge will be demonstrated during the second half of the semester through an academic service learning project designed to tutor elementary writers. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent). (F).
Prerequisite(s): Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1

EXPS 360  Effective Comm with Eng Lng Lm  1 Credit Hour
This course provides students with a structured experience with an international student in the University of Michigan-Dearborn’s English Language Proficiency (ELP) Program. Students are paired with an ELP student to meet on a weekly basis to provide opportunities to engage in conversation appropriate for academic settings. In this course students will have the opportunity to develop their understandings of the complexity of aural/oral language communication for English language learners.
Restriction(s):
Can enroll if Level is Undergraduate

EXPS 400  STEM2 Teaching and Learning  3 Credit Hours
The content of this course and the pedagogy employed will provide students with experiences in topics related to the integration of science, technology, engineering, health and mathematics (STEM2). Students will experience examples of STEM2 activities and will explore how STEM2 disciplines impact society. (YR)
Prerequisite(s): EXPS 220 and MATH 385
Corequisite(s): EXPS 401
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate NCFD or Post-baccalaureate Cert only or Junior or Senior

EXPS 401  STEM2 Teach/Learn Internship  1 Credit Hour
This internship will provide students an opportunity to gain experience with K-8 students in an educational setting such as a K-8 classroom, an afterschool program, museums, etc. Requires a minimum of 45 clock hours spread over the semester at the placement site working with the students and the assigned instructor/supervisor on STEM2 activities. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent). (YR).
Prerequisite(s): EXPS 220 and MATH 385 and Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1
Corequisite(s): EXPS 400

EXPS 407  Inquiry-based Math and Science  3 Credit Hours
This inquiry-based laboratory course intends to support the learning of early childhood educators (birth to grade 2) in foundations of science and mathematics. The course integrates concepts and processes that arise in both disciplines, such as classification; units and measurements; shapes and structures and their properties; patterns; problem solving; representation; cause and effect; use of evidence (three credits). Required for Early Childhood Comprehensive Major. Elective for Elementary Education Certification Students. Elective for Children and Families Students. Students cannot receive credit for both EXPS 407 and 507. The required lab fee is to cover course materials.
Prerequisite(s): EXPS 220 and MATH 385
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services
Can enroll if Major is General Studies, Early Childhood

EXPS 410  Multicult in School and Soc  3 Credit Hours
Examines ways to address the needs of diverse student populations. Issues of race, ethnicity, class, gender, and language are explored. Historic and ongoing issues of equity, particularly in school settings, are considered. The focus is on providing an education of high quality to all students.
Restriction(s):
Cannot enroll if Class is Freshman
EXPS 415  Evolution for Teachers  1 to 3 Credit Hours
Course is designed to meet the needs of grade K-12 teachers teaching about evolution. The Michigan Department of Education requires students to be able explain how scientists construct and scientifically test theories concerning the origin of life and evolution of species.

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

EXPS 420  Science Capstone  3 Credit Hours
A capstone course for pre-service elementary teachers with a laboratory component designed to assist students in achieving deep understanding of a broad scientific concept and a discussion component designed to introduce and provide practice in classroom research. Students will use the classroom research to prove misconceptions about the scientific concept explored in the laboratory. Students must submit the following clearances as prerequisites in order to register for this class (Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent).

Prerequisite(s): NSCI 231 and NSCI 232 and NSCI 233 and EDD 485* and Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if Level is Undergraduate

EXPS 443  Family/School/Community Collab  2 Credit Hours
Characteristics, roles, and functions of contemporary families are described. Various communication and training strategies designed to promote collaboration and teamwork within and between the school staff, the families, and community are described and practiced through discussion, problem-solving activities, and role playing. Family effectiveness assessment instruments and strategies are also described and practiced.

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior
Can enroll if Level is Undergraduate

EXPS 450  Issues in STEM2 and STEM2 Ed  3 Credit Hours
The content of this course will provide students with experiences in issues related to STEM2 education (STEM2: Science, Technology, Engineering, Mathematics and Medicine). Topics addressed will include definitions of STEM2, the value of STEM2 to society, the integration of STEM2 fields, developmentally appropriate STEM2 activities for K-12 students, misconceptions of STEM2, STEM2 careers and local issues related to STEM2 in Michigan. Students will experience examples of STEM2 activities and will explore how STEM2 disciplines impact society.

(YR)

Prerequisite(s): (MATH 104 or MATH 105 or MATH 113 or MATH 114 or MATH 115 or MATH 116 or MATH 131) and (NSCI 101 or NSCI 120 or NSCI 121)
Restriction(s):
Can enroll if Level is Undergraduate

EXPS 460  Capstone: Trnds & Iss Literacy  3 Credit Hours
This course is for pre-service teachers in the elementary certification program majoring in reading. In this course students will explore topical issues relevant to the teaching of literacy in preparation for becoming participating members in the professional community of literacy teachers.

Prerequisite(s): EDD 468 and EDD 471 and EDD 467
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Senior
Can enroll if College is Education, Health, and Human Services

EXPS 493  Simulation and Gaming  1 to 3 Credit Hours
This course focuses on simulation and gaming as approaches to learning which are fundamentally different from methods traditionally used in education, industry, business, and psychology. Students will have the opportunity to examine many different types of simulations and games and to participate in selected ones. They will also be able to design one to use in their own area of interest.

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate
Cert only or Junior or Senior

EXPS 498  Exploring Writing/Chld&Yng Ad  3 Credit Hours
This course provides a theoretical foundation for writing instruction of children/adolescents in grades K-8. Emphasis is placed on modeling, instructional strategies, and assessment for supporting student writers that pre-service and in-service teachers can use to facilitate students' development of written language across various genres. TB clearance, criminal background check, and bloodborne pathogens/infectious diseases training required.

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Graduate

EXPS 499  Individ Res in Lit in Educ  1 to 3 Credit Hours
Requires the student to initiate and carry to completion a literature in education-based research project under the supervision of a faculty member. May be elected more than once for a total of not more than 3 credits as approved by advisor. Written permission of instructor. (F,W,S).

Restriction(s):
Can enroll if Class is Undergrad Certification only or Junior or Senior
Can enroll if Level is Undergraduate

Other Content
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
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Finance (FIN)

FIN 200  Personal Finance  3 Credit Hours
To survey financial planning for the individual. Topics include: bank relations, credit, borrowing money, savings, budgeting, investments, stocks and bonds, mutual funds, insurance, real estate, annuities, social security, income taxes, wills, trusts and estate planning.
Restriction(s):
Cannot enroll if Class is Graduate
Can enroll if College is Business

FIN 401  Corporate Finance  3 Credit Hours
Introduces the financial goals of a corporation with particular attention to the creation of value. The time value of money and the valuation of financial and real assets receive particular attention. Additional topics include risk and return, market efficiency, short-term financial management, and the domestic and international economic environments.
Prerequisite(s): ACC 298 and ECON 201 and ECON 202 and (DS 300* or DS 301* or IMSE 317*)

FIN 402  Advanced Corporate Finance  3 Credit Hours
To provide the study of advanced topics, with particular attention to capital structure and dividend policy. Additional topics such as hedging, option pricing, agency theory, methods of financing, and corporate control will be presented. Global aspects of these topics will be addressed where appropriate. (YR).
Prerequisite(s): FIN 401 and (DS 300 or DS 301)

FIN 406  Fin Mkts and Institutions  3 Credit Hours
This course will introduce students to the financial markets, institutions, and instruments. The contents consist of the role and importance of the financial markets, interest rate determination and security valuation, the functions of money, bond, mortgage, stock, foreign exchange and derivative securities markets, the activities of financial institutions such as insurance companies, securities firms and investment banks, hedge funds, and pension funds, and management of credit and interest rate risks on the balance sheet of financial institutions. Familiarity with these topics is necessary for students to be competent in their future professional career in finance. (YR)
Prerequisite(s): FIN 401 and (DS 300 or DS 301)

FIN 407  Investment Fundamentals  3 Credit Hours
To study the current investment scene and analyze the characteristics of securities and the role in investment strategies. Topics include: securities markets, bonds, stocks, options, investment strategies, portfolio theories and management.
Prerequisite(s): FIN 401 and (DS 300 or DS 302)

FIN 411  Financial Planning  3 Credit Hours
This course introduces students to the primary areas of personal financial planning and helps them prepare for the professional financial planning examinations. Topics include overview of the financial planning process, analysis of clients' needs; principles of personal income taxation; investment analysis and planning; retirement and estate planning; insurance planning and major types of insurance, ethics and standards of professional practice; and quantitative methods used in the analysis and derivations of decision rules. This course is designed for students who consider a career in financial advising, as well as those who are interested in managing their own personal finances. Students will practice critical thinking and business communication through written presentation of case analysis and recommendations. (YR)
Prerequisite(s): FIN 401 and (DS 300 or DS 301)

FIN 412  Retirement Planning  3 Credit Hours
This course introduces students to the nature of retirement planning analysis and the functions of major retirement plans and other investment-oriented employee benefits, as well as discusses advantages and disadvantages of the various wealth accumulation and tax deferral alternatives. Topics include the administration, characteristics and distributions of qualified corporate retirement plans such as pension and profit sharing plans; non-corporate retirement programs such as IRAs and Simplified Employee Pension (SEPs) plans. In addition, stock options, non-qualified deferred compensation plans, and other non-pension related benefits, as well as recent legislation will be examined. This course prepares students for career pursuit in financial advising or human resources management, as well as for the professional financial planning examinations. Students will practice critical thinking and business communication through written presentation of case analysis and recommendations. (YR)
Prerequisite(s): FIN 401 and (DS 300 or DS 301) and FIN 411*

FIN 443  Com Bank: Functn and Operatns  3 Credit Hours
The topics to be included in the course are: commercial bank management, loan portfolio management and international banking. Specific aspects of the commercial banking environment, such as legislation and regulation, are also covered.
Prerequisite(s): FIN 401 and (DS 300 or DS 301)

FIN 445  Corporate Fin Models and Appls  3 Credit Hours
This course focuses on the analysis of financial decisions by applying theories and models to practical problems and cases. The subject coverage includes capital budgeting and financing (cost of capital, capital structure, dividend policy, etc.), working capital management (credit, inventory, bank relations, etc.), and other special topics (e.g., mergers and acquisitions). The coursework is appropriate for students seeking careers in corporate financial management, commercial lending, and investment banking.
Prerequisite(s): FIN 402 and (DS 300 or DS 302)

FIN 447  Derivative Markets  3 Credit Hours
Going beyond investment fundamentals, the focus of this course is on the more speculative aspects of investment. Speculative securities (such as options, warrants, and convertibles) and commodity futures (including financial and currency futures) are covered. The structure of the speculative markets and the role of speculation, such as hedging, risk-shifting, and the establishment of future-spot price relationship are analyzed in the context of a competitive market environment.
Prerequisite(s): FIN 401 and (FIN 402 or FIN 407 or FIN 443) and (DS 300 or DS 302*)

FIN 448  Real Estate Financing  3 Credit Hours
The purpose of this course is to introduce the student to the different types of mortgages, the sources of real estate loans and the workings of the secondary mortgage markets. It will also cover the application, loan processing, underwriting, and closing processes as well as closely related topics such as property appraisal and insurance, title insurance, and foreclosures.
Prerequisite(s): FIN 401
FIN 456  Fixed Income Securities  3 Credit Hours
The fixed income market, accompanied by the introduction of sophisticated financial engineering techniques, has grown enormously over the last two decades. Today, the fixed income market has been a vital segment of the global financial market. This course covers major topics associated with this market, including bond pricing, yields, and volatility; term structure of interest rates and yield curve; market structure and analytical techniques for Treasury, municipal, corporate bonds, mortgage-backed securities, asset-backed securities, and bond with embedded options. The fundamental objective of this course is to help students develop analytical skills for pricing fixed income securities and managing interest rate risk. In addition, materials covered in this course are compatible with the Common Body of Knowledge in Analysis of Debt Investments that is required by the Chartered Financial Analysts (CFA) examination. Students will not receive credit for both FIN 456 and FIN 656.

Prerequisite(s): FIN 407 and FIN 447 and (MATH 113 or MATH 115 or Mathematics Placement with a score of 116)

Restriction(s):
Can enroll if Class is Senior or Junior
Can enroll if College is Business
Can enroll if Major is Finance

FIN 457  Investment Fund Management  3 Credit Hours
This course introduces finance students to investing approaches and analytical techniques including both Intrinsic and Relativistic analyses used for security analysis employed and implemented by professional money managers. The course is recommended for finance students seeking to develop careers related to money management, investment analysis, financial analysis, portfolio management and related financial services careers. The main focus of the course is to gain the experience and skills of equity securities analyses through the Student Managed Investment Fund. The course requires application of fundamental and intrinsic equity analyses valuation. Students cannot receive credit for both FIN 457 and FIN 657. (FW,OC)

Prerequisite(s): FIN 407

FIN 484  Seminar: Financial Management  1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.

Prerequisite(s): FIN 401

Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

FIN 494  Research:Financial Mgmt  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.

Prerequisite(s): FIN 401

Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally.

French (FREN)

FREN 101  French Language & Culture I  4 Credit Hours
Full Course Title: Introduction of French Language and Culture I - First course in a two-course elementary French sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in the French-speaking world. (F).

Prerequisite(s): FREN 101 or French Language Placement with a score of 102 or French Language Placement with a score of 201 or French Language Placement with a score of 301 or French Language Placement with a score of 302

FREN 201  Intermediate French I  4 Credit Hours
An intermediate language course designed to increase the student’s ability to read, speak, and write French. The course will utilize a wide range of reading selections representative of modern French prose as the basis for class discussions and written assignments. A systematic review of grammar and oral exercises should enable the student to make definite progress in conversation and composition. (F).

Prerequisite(s): French Language Placement with a score of 201 or French Language Placement with a score of 202 or French Language Placement with a score of 301 or French Language Placement with a score of 302 or FREN 102

FREN 202  Intermediate French II  4 Credit Hours
Continuation of FREN 201. Further readings in modern French prose, extensive practice in conversation and composition. (W).

Prerequisite(s): FREN 201 or French Language Placement with a score of 202 or French Language Placement with a score of 301 or French Language Placement with a score of 302

FREN 234  French Conversation  1 to 2 Credit Hours
Development of conversational skills through discussion of contemporary readings and the use of communicative activities and games. Emphasis will be placed on vocabulary acquisition by students, on improving their pronunciation, and on increasing their overall fluency in French. (S).

Prerequisite(s): FREN 102

FREN 235  Fren Conversation and Culture  2 Credit Hours
Intensive practice in developing conversational skills through a coordinated program of classroom and field activities in France. Students will read and discuss current materials of various sorts and will perform skits and other oral exercises designed to increase their fluency in French. A series of planned, extracurricular activities (visits to museums and historical monuments, viewing of plays, interviews of average Frenchmen) will enable students to profit from direct contact with the French and their culture.

Prerequisite(s): FREN 102

* An asterisk denotes that a course may be taken concurrently.
FREN 290  Topics in French  1 to 3 Credit Hours  
Examination of problems and issues in selected areas of French. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

FREN 301  Advanced Conversation and Comp  3 Credit Hours  
An advanced course in conversation, composition, and syntax. Numerous oral reports and weekly written assignments based on readings from current sources; discussion of a recent French motion picture; translation exercises and the study of specific topics in French grammar. (F).
Prerequisite(s): FREN 202 or French Language Placement with a score of 301 or French Language Placement with a score of 302.

FREN 302  Advanced Conversation and Comp  3 Credit Hours  
Continuation of FREN 301. (W).
Prerequisite(s): FREN 301 or French Language Placement with a score of 302.

FREN 305  Language of Business  3 Credit Hours  
A systematic presentation of the vocabulary and conventions of business French. Students will receive extensive training in composing business letters, reports, vitas, and similar texts. They will be exposed to French practices in correspondence, accounting and record keeping. They will also be required to translate various business documents from English to French (and vice versa) and to familiarize themselves with the specialized vocabulary of computers. (OC).
Prerequisite(s): FREN 301.

FREN 306  Cult Intro to French Business  3 Credit Hours  
An introduction to the practices and organization of the French business world. Students will learn how a typical French firm is structured and how business is normally conducted in France. Special attention will be given to those differences in organization and operation which contrast French businesses with our own. The class will also examine the impact of history and general cultural attitudes on French business practices of today. (OC).
Prerequisite(s): FREN 301.

FREN 308  Advanced Writing  3 Credit Hours  
Intensive practice in writing expository prose in French. Students will complete a wide variety of writing assignments (resumes, critical analyses, explications de texte, and the like) over the course of the semester. Class sessions will be devoted to the discussion of student papers and technical issues related to effective writing. Students should expect to prepare several drafts of each assignment under the close supervision of the instructor. (OC).
Prerequisite(s): FREN 301.

FREN 330  French Lit: Md Ages-18 Century  3 Credit Hours  
A survey of French literature through the Enlightenment based on the study of individual masterpieces of principal French authors: Villon, Rabelais, Montaigne, Pascal, Moliere, Racine, Montesquieu, Voltaire, and Rousseau. (OC).
Prerequisite(s): FREN 301.

FREN 331  French Lit: 19th-20th Century  3 Credit Hours  
The sequel to FREN 330. A survey of French literature from Romanticism to the Theater of the Absurd and the nouveau roman. Writers studied will include Balzac, Stendhal, Baudelaire, Flaubert, Proust, Gide, Camus, Sartre, Beckett, and Sarraute. (OC).
Prerequisite(s): FREN 301.

FREN 332  French Cinema  3 Credit Hours  
A survey of French films from the experiments of the turn of the century to the trends of the present day. Representative silent films, "classic" and "new-wave" movies of the 1930's and 50's, as well as contemporary productions will be presented in their cultural context and the contributions of major French directors to filmmaking will be highlighted. Attention will also be given to the basic elements of film as a means of expression: camera angle, distance, movement, and editing. (OC).
Prerequisite(s): FREN 301.

FREN 334  Workshop in French Theater  3 Credit Hours  
This course will provide a brief survey of representative masterpieces of the French theater. Students will be required to read and analyze a number of celebrated plays and then to perform selected scenes from them. (OC).
Prerequisite(s): FREN 301.

FREN 336  French Civilization of Past  3 Credit Hours  
An introduction to the civilization of France (from the Middle Ages to the 20th Century). This course will examine the social and historical developments and the accomplishments in the arts and literature that have combined to shape the French nation. (OC).
Prerequisite(s): FREN 301.

FREN 337  France in the 20th Century  3 Credit Hours  
An introduction to France of the Third, Fourth, and Fifth Republics. This course will examine the major political, social, and economic issues of France of the 20th Century as well as its contributions to literature and the arts. (OC).
Prerequisite(s): FREN 301.

FREN 338  France of Today  3 Credit Hours  
An exploration of various facets of contemporary French civilization. Although students will consider historical and political developments since World War II, special attention will be given to the values and attitudes of the French, to the contrasting modes of life in Paris and the provinces, and to important forms of popular culture. (OC).
Prerequisite(s): FREN 301.

FREN 339  Francophone Lit and Civil  3 Credit Hours  
An introduction to twentieth-century award-winning texts from the Caribbean, Canada, North Africa and West Africa. Students will analyze the strategies through which these powerful, dramatic, post-colonial writers address such issues and themes of universal relevance as love and the search for identity, while also expressing the experience and culture realities of his or her own country. Representative authors include Birago Diop, Simone Schwartz-Bart, Arlette Cousse, Anne Hebert, Roch Carrier, Michel Tremblay, and Tehar Ben Jelloun. (OC).
Prerequisite(s): FREN 301.

FREN 340  France's Sites of Memory  1 Credit Hour  
This course complements French 336, Civilization of the Past. Students will travel to France to visit the "sites of memory" that have shaped France's collective memorial heritage, from the Roman Empire to the French Revolution, to today. Visits to the Catacombs, Roman ruins in the South of France, Roman and Gothic cathedrals, Renaissance castles, museums, royal palaces, and the Place de la Bastille will bring France's history and civilization alive, and help crystallize a material memory of France's rich culture. (OC).
FREN 355  Introduction to Translation  3 Credit Hours
French 355 is designed as an introduction to the art of translation from English to French and French to English. The course will enhance students' ability to translate fluently from the source language to the target language. Students will study the theory of translation; practice translating a variety of genres; improve their knowledge of written French; increase their vocabulary, sociolinguistic register, and idiomatic expressions. (YR)
Prerequisite(s): FREN 202

FREN 375  Parisian Itineraries  3 Credit Hours
"Parisian Itineraries" follows cultural developments in Paris, and literary responses to the specific nature of urban development in France in the 19th and 20th century in France. Students consider urban planning and expansion in Paris through cultural, historical, social and literary approaches, and analyze the connections between cultural voices and urban progress. The object of this course is thus the lived experience of Parisian urbanization through the various artistic representations.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

FREN 385  French Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in French are related to the subject matter of the second course and are discussed with a French- area faculty member. Materials are also integrated into the assignments of the second course. (F,W).
Prerequisite(s): FREN 202

FREN 388  Socio-Cltrl Iss Contemp France  3 Credit Hours
The course concentrates on a series of socio-cultural issues that are debated in France today, as well as on a number contemporary cultural and artistic phenomena. Particular attention is given to discourses on otherness and on the ways in which French cultural production and media constructions have reflected, reinforced, reshaped and, in some instances, contested the country's past and current dominant ideologies, and identities.
Prerequisite(s): FREN 301

FREN 390  Topics in French  3 Credit Hours
Examination of problems and issues in selected areas of French. Title as listed in schedule of classes will change according to content. Course may be repeated for credit when specific topics differ.

FREN 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in the humanities in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. May be repeated for a maximum of 6 credit hours. (F,W).

FREN 408  Writing and Translating  3 Credit Hours
A course designed to increase the written fluency of students who have already assimilated the advanced grammatical concepts introduced in the 301-302 sequence. Students will prepare weekly written assignments and will translate and analyze passages written in various styles. (OC).
Prerequisite(s): FREN 301 and FREN 302

FREN 490  Topics in French  1 to 3 Credit Hours
Examination of problems and issues in selected areas of French. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): FREN 301

* An asterisk denotes that a course may be taken concurrently.

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Geography (GEOG)

GEOG 201  Cultural Geography  3 Credit Hours
Overview of the major components of culture such as language, religion, agriculture, settlement patterns, and related landscape features in a spatial context. Emphasis on how various cultures perceive and interact with the environment. (F).

GEOG 203  Weather and Climate  3 Credit Hours
The controls and conditions of Earth's weather and climate including atmospheric circulation, precipitation processes, severe weather, climatic regions, and climatic change. (F).

GEOG 204  Landforms  3 Credit Hours
Processes and agents that shape the landscapes and landforms of the Earth's surface. The discussion of landforms is divided into two parts: (1) constructive processes and their spatial distribution and (2) gradational processes and their spatial distribution. (W).

GEOG 205  Geography of the United States  3 Credit Hours
A regional analysis of the United States that stresses the differences in the physical elements of landscapes that explain differences in economic development, cultural attainment, and land use and which, in turn, motivate regional interdependencies and interrelationships. (W).

GEOG 206  World Regional Geography  3 Credit Hours
World Regional Geography includes a systematic study of the world's geographic realms and regions, including Europe, Russia, Australia-New Zealand, East Asia, South Asia, Southwest Asia, N Africa, Subsaharan Africa, Middle and South America. Geographic concepts, such as map reading and spatial analysis, are first introduced. Then, the world is classified into geographic realms and regions using both physical and social criteria. Each region results from a unique interaction between the human societies and the physical environment. The physical, cultural, political, economic and social features of each region are studied, along with any special regional concerns or problems.

GEOG 300  Urban Geography  3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges such as sprawl, pollution, congestion, crime, poverty, etc., are addressed.

GEOG 302  Mapping Our World  3 Credit Hours
Mapping our World provides an introduction to geospatial techniques and the important roles spatial data play in today's world. This course introduces the students to basic concepts of geographic information systems, remote sensing and cartography. A focus of the course is on map analysis and map design.

GEOG 305  Intro to GIS  4 Credit Hours
The basic elements of geographic information systems, map interpretation and map design. Principles and methods of spatial data collection, analysis, and display are introduced. (W)
Prerequisite(s): GEOG 302
Corequisite(s): GEOG 305L

GEOG 305D  Intro to GIS & Cartogrphy Dis  0 Credit Hours
Required discussion session for GEOG 305.
Corequisite(s): GEOG 305
GEOG 307  Geography of Western Europe  3 Credit Hours
An analysis of the strengths, weaknesses, interrelationships, and interdependence of selected countries of this economically advanced region. (OC).

GEOG 310  Economic Geography  3 Credit Hours
Spatial aspects of the ways people make their living. Discussion of the spatial distribution of resources and wealth at various scales. Introduction of site selection and location analysis.

GEOG 315  Political Geography  3 Credit Hours
The spatial dimensions of political activity from the local to the global scale. Themes include: control of territory, relations among political entities, and political ideology.

GEOG 320  Global Climate Change  3 Credit Hours
This course explores concepts and current thinking on global climate change and environmental impacts. It covers the history of Earth’s climate, causes of climate change and current research attempting to forecast change. The biotic, economic, and social implications of climate change are discussed. (AY)
Prerequisite(s): GEOG 203 or ENST 203
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

GEOG 325  Global Cities  3 Credit Hours
The course focuses on comparing the urban form, economies, and social life in cities around the world. The societies of the westernized, developed world are already highly urbanized. Cities outside of this sphere are generally growing much faster and experiencing greater social and economic upheaval as a result. Understanding non-North American urbanization is a vital part of understanding cities in general. (F)

GEOG 327  Michigan Geography  3 Credit Hours
A geographic study of landforms, waterways, natural resources, landmarks and economic activities that contribute to the physical and cultural landscapes of Michigan. Population, industry, agriculture, recreation and tourism will all be considered. (S, W, YR)

GEOG 390  Topics in Geography  1 to 3 Credit Hours
Selected topics to be announced. (OC).

GEOG 390B  Topics in Geography  1 to 3 Credit Hours
TOPIC TITLE: Global Climate Change. This course explores concepts and current thinking on global climate change and environmental impacts. It covers the history of Earth’s climate, causes of climate change and current research attempting to forecast change. The biotic, economic, and social implications of climate change are discussed.

GEOG 399  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and the advising instructor.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
GEOL 342  Physical Oceanography  3 Credit Hours
An introduction to physical and chemical oceanography, fundamental
marine processes and plate tectonics. Interactions between the oceans
and atmosphere and the effect of greenhouse gases on the oceans and
the role of physical processes in global climate change will be studied.

GEOL 350  Geomorphology  4 Credit Hours
This introductory course is designed to familiarize students with
the fundamentals of river behavior and the general principles in
fluvial morphology, sedimentation, and hydraulic and stream bank
erosion. Applications of these principles are shown utilizing a stream
classification system. Problem solving techniques for watershed
management, stream restoration, non-point source pollution and
integration of ecosystem concepts in watershed management are
presented. A combination of both lecture and field applications are
provided. (F,AY)
Prerequisite(s): GEOL 118 or (GEOG 203 and GEOG 204)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

GEOL 370  Environmental Geology  3 Credit Hours
Interactions between people and the physical environment. Geological
hazards and natural processes, such as earthquakes, volcanism, floods,
landslides, and coastal processes. Relationships between geology and
environmental health, including chronic disease, water use and pollution,
land waste disposal, mineral resources, and energy use. Three hours lecture. (AY).
Prerequisite(s): GEOL 118

GEOL 372  Energy Resources  3 Credit Hours
Origin and development of fossil fuels (petroleum, coal, natural gas) and
of radioactive ores used in nuclear power. Renewable and alternative
energy sources, including hydro, solar, wind, biomass, and geothermal
power. Environmental impacts of energy use. Three hours lecture. (AY).
Prerequisite(s): GEOL 118 or ESCI 275 or ESCI 301

GEOL 375  Groundwater Hydrology  4 Credit Hours
Sources, occurrence, and movement of groundwater. Surface and
subsurface investigations. Principles of hydrogeology. Groundwater
pollution and management. Three hours lecture. (AY).
Prerequisite(s): GEOL 118

GEOL 377  Field Methods  1 Credit Hour
A week-long intensive field course dealing with geological field methods
and analysis of geological terrains. Use of Brunton compass and
clinometer, recognition and identification of geological structures,
preparation and interpretation of geological maps, and use of aerial
photographs. May be repeated for credit when destination varies.
Organization meeting followed by one-week trip. (YR).
Prerequisite(s): GEOL 118

GEOL 390  Current Topics in Geology  1 to 3 Credit Hours
A course in special topics current to the field of geology. Topics and
format for the course may vary. See current Schedule of Classes. (OC).
Prerequisite(s): GEOL 118

GEOL 440  Advanced GIS Applications  3 Credit Hours
This course offers an opportunity for students with a background in
the fundamentals of geographic information systems (GIS) to apply
the analytical capabilities of geospatial technology to model real-world
situations in support of decision making. Particular emphasis is given
to data development and management, spatial and statistical analyses,
customization, and effective visualization.
Prerequisite(s): GEOL 305 or ESCI 305 or GEOG 305

GEOL 470  Geodatabase Design & Mgmt  3 Credit Hours
Full Title: Geodatabase Design & Management This course focuses
on the design, creation, and management of geodatabases. Topics
include database theory, database models, spatial data standards,
the collection and pre-processing of geospatial data, topology and
topological relationships, metadata creation and storage, and cloud
computing. (AY,F)
Prerequisite(s): GEOL 305 or ESCI 305 or GEOG 305

GEOL 475  Contaminant Hydrogeology  3 Credit Hours
Advanced lecture treatment of selected topics in subsurface hydrology
including contaminant transport and fate of organic and inorganic
constituents, aquifer test analysis, and the use of modeling in the
analysis of selected case histories. (AY).
Prerequisite(s): GEOL 375
Restriction(s):
Can enroll if Class is Junior or Senior

GEOL 478  Geology of the National Parks  3 Credit Hours
Study of the geology (stratigraphy, structure and geomorphology) of
major national parks. Specific parks to be visited varies from year to year,
allowing the course to be repeated once for credit. Emphasis is placed
on taking field notes, describing rock sequences in outcrop, geologic
map reading and aerial photograph interpretation. Special attention is
focused on the understanding and development of cratonic sequences,
particularly the regional correlation (both lithostratigraphic and time-
stratigraphic) of sandstone, shale and limestone facies, and small and
large scale geologic features such as folds and faults. Depending on the
national park being visited the students may explore paleographic and
paleoclimatic evidence from fossils as well as sedimentary structures.
This is a field-oriented course requiring a significant amount of physical
exertion. (YR)
Prerequisite(s): GEOL 118 and GEOL 218
Restriction(s):
Can enroll if Class is Junior or Senior

GEOL 487  Groundwater Modeling  3 Credit Hours
Lecture and laboratory applications of two- and three-dimensional
groundwater flow and contaminant transport problems. Visual Modflow,
Modpath (PLOT and SURTR), MT3D and Surfer will be used to evaluate
remedial alternatives (e.g. pump and treat, funnel and gate, or trench
and drain systems). EPA's Basins software combined with ESRI's GIS
software ArcView will be used to evaluate and compare the Rouge River
watershed with other small-scale watersheds in Michigan. (AY)
Prerequisite(s): GEOL 375

GEOL 498  Independent Study in Geology  1 to 3 Credit Hours
Library research and independent study performed under the guidance of
a faculty member. Permission of instructor. (F,W,S).

GEOL 499  Laboratory and Field Research  1 to 3 Credit Hours
Directed laboratory or field research performed under the guidance of
a faculty member. Four to twelve hours laboratory or field study. Permission
of instructor. (F,W,S).

* An asterisk denotes that a course may be taken concurrently.
Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

German (GER)

GER 101  German Language and Culture I  4 Credit Hours
First course in a two-course elementary German sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in the German-speaking world. (F).

GER 102  German Language and Culture II  4 Credit Hours
Second course in the two-course elementary sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, and writing. (W).
Prerequisite(s): GER 101 or German Language Placement with a score of 102 or German Language Placement with a score of 201 or German Language Placement with a score of 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 105  Conversational German  2 Credit Hours
The course is designed to help students develop basic oral communication skills in German. Emphasis is on a maximum use of spoken German in real or simulated everyday situations during each class period. The essentials for grammar will be taught through patterns rather than analytical presentation. May not be used to fulfill the symbolic language requirement.

GER 201  German Language & Culture III  4 Credit Hours
An intermediate language course in speaking, reading, and writing German. Class assignments and discussions will be based on a wide variety of material ranging from German language films to anthologies of German prose. There will be a review of grammar, but emphasis is on reading and discussion. (F).
Prerequisite(s): GER 102 or German Language Placement with a score of 201 or German Language Placement with a score of 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 202  Intermediate German II  4 Credit Hours
A continuation of GER 201, with an even greater emphasis on reading and speaking. (W).
Prerequisite(s): GER 201 or German Language Placement with a score of 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 234  German Conversation  1 to 2 Credit Hours
Development of conversational skills through discussion of contemporary readings and the use of communicative activities and games. Emphasis will be placed on vocabulary acquisition by students, on improving their pronunciation, and on increasing their overall fluency in German. (OC).
Prerequisite(s): GER 102

GER 301  Advancing Competencies I  3 Credit Hours
Focusing on a particular topic or topics relating to the German-speaking world, students will strengthen and expand their reading, writing, speaking, listening, and cultural competencies. Students will focus on developing strategies for listening and reading more advanced primary "texts." They will have extensive practice in recognizing and imitating a variety of written and oral genres.
Prerequisite(s): GER 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 302  Advancing Competencies II  3 Credit Hours
Focusing on a particular topic or topics relating to the German-speaking world, students will strengthen and expand their reading, writing, speaking, listening, and cultural competencies. Students will focus on developing strategies for listening and reading more advanced primary "texts." Students will have extensive practice in recognizing and imitating a variety of written and oral genres.
Prerequisite(s): GER 301 or German Language Placement with a score of 302

GER 305  German for the Professions  3 Credit Hours
Drawing on written and oral authentic texts, the course will focus on the proper forms of written and oral communication in a variety of professional settings in the German-speaking world. It will also stress appropriate reading and listening strategies with a focus on the potential future professions of the enrolled students.
Prerequisite(s): GER 301

GER 306  Cross-Cult Comptncy&Professns  3 Credit Hours
An in-depth study of current professional practices as carried on between agencies in the English and the German-speaking worlds. Students will focus on cultural differences, thereby strengthening cross-cultural competencies at the same time deepening their speaking, listening, writing, and reading skills.
Prerequisite(s): GER 301

GER 371  Germ Lit: Classic and Romantic  3 Credit Hours
Readings include works by Lessing, Schiller, Goethe, Meist, E.T.A. Hoffmann, and Novalis. Analyses in lectures, discussion and writing will try to illuminate the works themselves and the world views of their age. (AY).
Prerequisite(s): GER 301

GER 372  Introduction to German Lit  3 Credit Hours
A survey of German Literature from 19th century realism to the contemporary post-modernism and neo-realism. Writers studied will include both canonical and non-canonical authors, for example, Gerhard Hauptmann, Marie-Luise Fleisser, Georg Kaiser, Irmgard Keun, Bertolt Brecht, Anna Seghers, Ilse Aichinger, and Christa Wolf. The class will be a combination of lecture and discussion with a substantial writing component. (AY).
Prerequisite(s): GER 301
GER 374  The History of German Cinema  3 Credit Hours
In this course, we explore the history of German cinema through primary and secondary texts on films from the silent period through unification. Concomitantly, we will read a Mary Fulbrook’s history of Germany in order to place these films within the proper historical contexts and in order to enable us to examine the ways in which German history has insinuated itself in all film genres. The film section highlights the major movement in German cinema since its inception and gives particular attention to the representations of German history and the ways in which German history makes itself apparent in a variety of genres. The class will also consider the interactions between German cinema and Hollywood through clips highlighted in lectures and student presentations. (OC).
Prerequisite(s): GER 301
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

GER 376  Contemporary German Cultures  3 Credit Hours
An exploration of the assumptions which underlie everyday life in German-speaking countries (Federal Republic of Germany, Austria, Switzerland). Topics include social intercourse, school systems, medicine, citizens’ understanding of nation, and individuals’ relationship to space. (YR).
Prerequisite(s): GER 301

GER 377  German Culture & Civilization  3 Credit Hours
Full Course Title: German Culture and Civilization-From the Romans to the Reformation- An introduction to the civilization of the German-speaking countries of Europe from the Middle Ages to the 20th Century. The course examines the arts, history, culture, and institutions that have shaped the Germanic societies.
Prerequisite(s): GER 301

GER 380  Praktikum  1 Credit Hour
This course will be offered in conjunction with a 300- or 400-level German literature, film, or cultural course in translation taught by a member of the German faculty. The one-credit course will be conducted entirely in German. Students will develop their language skills dealing with the topics of the course in translation. They will also be required to read related texts in German. Students who successfully complete the Praktikum and the corresponding German in translation course can receive four credits of German. The topics will vary depending on the English language content course. Students must be concurrently registered in appropriate 300- or 400-level courses taught by a German instructor. (OC).
Prerequisite(s): GER 301

GER 385  German Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in German are related to the subject matter of the second course and are discussed with a German-area faculty member. Materials are also integrated into the assignments of the second course. (F;W).
Prerequisite(s): GER 202

GER 390  Topics in German  3 Credit Hours
Examination of problems and issues in selected areas of German. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

GER 399  Ind Studies in German Lit  1 to 3 Credit Hours
Readings or analytical assignments in German selected in accordance with the needs and interests of those enrolled. (F;W).

GER 380  Praktikum  1 Credit Hour
This course will be offered in conjunction with a 300- or 400-level German literature, film, or cultural course in translation taught by a member of the German faculty. The one-credit course will be conducted entirely in German. Students will develop their language skills dealing with the topics of the course in translation. They will also be required to read related texts in German. Students who successfully complete the Praktikum and the corresponding German in translation course can receive four credits of German. The topics will vary depending on the English language content course. Students must be concurrently registered in appropriate 300- or 400-level courses taught by a German instructor. (OC).
Prerequisite(s): GER 301

GER 385  German Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in German are related to the subject matter of the second course and are discussed with a German-area faculty member. Materials are also integrated into the assignments of the second course. (F;W).
Prerequisite(s): GER 202

GER 390  Topics in German  3 Credit Hours
Examination of problems and issues in selected areas of German. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

GER 399  Ind Studies in German Lit  1 to 3 Credit Hours
Readings or analytical assignments in German selected in accordance with the needs and interests of those enrolled. (F;W).

GER 490  Topics in German Lit and Civ  3 to 4 Credit Hours
Examination of problems and issues in selected areas of German studies. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

GER 499  Adv Individual Proj in German  1 to 4 Credit Hours
Advanced individual study project in German language, literature, or civilization may be pursued under the direction of a faculty supervisor. (OC).
Restriction(s):
Can enroll if Class is Senior or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Global Cultures (GLOC)

GLOC 234  Japanese Economy & Business  3 Credit Hours
In this course, students can obtain fundamental knowledge on stylized facts of Japanese economy as compared with those in the US and some other countries, and understand economic theories to put profound interpretations on them. Stylized facts seem to be old and some of them may have been obsolete, although they contain essential logical points. However, they are still useful for understanding Japanese economic systems. Thus, students are required to discuss current conditions on Japanese economy and firm system, considering stylized facts and theoretical backgrounds. It is essential to distinguish between changing phenomena and unchanged principles. Students have an opportunity to take a tour to a factory in a leading company. In the final class, students have to give team presentations and individually submit a short essay on the topics provided or the ones they come up with. As for the structure of the classes, we cover fundamental stylized facts, economic theories (or theoretical frameworks), and data analyses (historically and currently). This course is composed of three parts: (1) Japanese economic system, (2) Japanese firm system and (3) Japanese macroeconomic conditions.

GLOC 301  Intro to Global Cultures  3 Credit Hours
The course introduces students to the various concepts and notions attached to the phenomenon known as globalization from several disciplinary approaches including history, political science, economic, cultural geography, environmental sciences, and anthropology. It, then, delves in to an in-depth examination of globalization and its ideologies, particularly the consensus as well as the controversies it engenders. The course particularly focuses on the relation between globalization and culture.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate
GLOC 325  Political Islam  3 Credit Hours
This course is designed as an introduction to the main issues and themes in the study of political Islam and Muslim Politics, providing a broad overview of the pertinent key concepts and issues. It provides a historical approach to the study of political Islam, and touches upon the nineteenth century Islamic revivalism. It also explores diversity in contemporary Islamic thought and global Islamist movements.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Health and Human Service (HHS)

HHS 100  Personal Health and Wellness  4 Credit Hours
In this course, students will examine the core concepts, conceptual frameworks, and epidemiological data related to personal health and wellness. Students will learn to apply the scientific method to the systematic study of common health problems. Students will gain a better understanding of their own health-related attitudes, beliefs, and behaviors and learn strategies to manage their stress and improve their health and wellness. (F,S,W)

HHS 101  Intro to Health Education  3 Credit Hours
This course is designed to introduce students to the principles and practices of health education. Students will explore the theoretical and practical issues of health education and will identify and apply health education principles to health challenges facing individuals, groups and communities. (F,W,S)

HHS 200  Introduction to Public Health  3 Credit Hours
Introduction to Public Health (HHS 200) is the introductory professional course in the Public Health undergraduate program. This course identifies and explores the theoretical and practical issues in public health. Students successfully completing the course will have an understanding of the goals of public health. Students will receive a fundamental understanding of epidemiological study design and the role of data for public health research. They will also understand the impact of individual behaviors and the environment on health. Lastly, students will receive an introduction of the role of governmental agencies and policy on public health practice.

HHS 201  Medical Terminology  3 Credit Hours
This course will focus on an in-depth presentation of medical language to serve as a solid foundation for students interested in health care, medicine, nursing, pharmacy, physical therapy, or related careers. Medical terminology for both health and disease is presented in relation to human structure and function. Understanding of the course content builds a framework by introducing the key terms as they are applied to specific body systems. (F,W,S)

HHS 202  Mental Health Terminology  3 Credit Hours
Mental Health Medical Terminology orients students to mental health disorders. A brief clinical overview from a lay perspective orients students to the various mental disorders including mental retardation and learning disorders, behavioral disorders, anxiety disorders, substance abuse disorders, impulse control disorders and sleep disorders. A special emphasis will be made on the relationship between substance abuse problems and mental illness, as well as the physical aspects of drug use. Students learn the specific criteria for mental illness classification through use of The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM 5). (OC)

HHS 210  Intro to Social Work  3 Credit Hours
Introduction to Social Work is intended to provide a basic introductory course to assist professionals in related and relevant fields in the theories, approaches, and practices of social work. Students will be exposed to the art and science of the social work discipline through academic research and case studies, experiential learning, group discussion, and supporting activities. (F,W,S)

HHS 225  Stress Management  3 Credit Hours
This course focuses on developing student’s ability to understand and influence scientific inquiry in health and human services. Students will learn how research methodology frames inquiry and, subsequently, how knowledge is built and used to make evidence-based decisions in practice.

HHS 230  Research Methods in Human Srvc  3 Credit Hours
This course introduces students to environmental health as a core discipline within the field of public health. It is for any student interested in how the environments where we live, work, and play may affect our health, and it is particularly applicable for those pursuing careers in public health, clinical health, or allied fields. Specifically, the course provides students with an introduction to environmental health science, communication, and policy. Students will examine many case studies to understand the patterning and implications of environmental risks and protective factors in communities through Metro Detroit and the U.S. related to several key pathways (e.g., air, water, climate, built environment). Throughout the semester, considerable attention will be given to causes and consequences of local and national environmental justice issues. Students will gain exposure to methods and resources they may use to assess and address environmental health concerns as scholars, activists, or practitioners. (W)

HHS 250  Intro to Environmental Health  3 Credit Hours
This course introduces students to environmental health as a core discipline within the field of public health. It is for any student interested in how the environments where we live, work, and play may affect our health, and it is particularly applicable for those pursuing careers in public health, clinical health, or allied fields. Specifically, the course provides students with an introduction to environmental health science, communication, and policy. Students will examine many case studies to understand the patterning and implications of environmental risks and protective factors in communities through Metro Detroit and the U.S. related to several key pathways (e.g., air, water, climate, built environment). Throughout the semester, considerable attention will be given to causes and consequences of local and national environmental justice issues. Students will gain exposure to methods and resources they may use to assess and address environmental health concerns as scholars, activists, or practitioners. (W)

HHS 260  Global Health  3 Credit Hours
In this course, students will examine the core concepts, major actors and organizations, and functions of public health on a global scale. Students will gain knowledge of comparative health care systems, as well as global challenges, such as climate change, nutrition, and maternal and child health. We will analyze historic and contemporary case studies to better understand current disease burden and health inequities, ethical considerations, and potential policy or programmatic solutions to global health issues. (YR)
HHS 300  Intro to Health Policy  3 Credit Hours
The aim of this course is to provide students with an overview of the U.S. health care system, its components, and the policy challenges created by its organization. We will focus on the major US governmental and non-governmental political and policy players, health policy institutions and important issues that cut across institutions, including private insurers and the federal/state financing programs (Medicare and Medicaid/ SCHIP) (F,W,S)
Restriction(s):
Cannot enroll if Class is freshman

HHS 305  Introduction to Play  3 Credit Hours
This course introduces the concept, theory, and experience of play, including methodological approaches to the research and study of play in therapeutic, clinical, medical, and educational environments. Students will develop strategies for observing, engaging, and supporting play in variety of settings, and will gain an understanding of the principles, applications, and limitations of play therapy and the role of play in the practice of professionals in human services and education. (F,W,S)
Restriction(s):
Cannot enroll if Class is freshman

HHS 306  Program Plan Implementation  3 Credit Hours
Full Course Title: Program Planning and Implementation This course introduces students to program planning in health and human service settings. In these settings, leaders must be able to develop, implement, and monitor programs that are informed by theory and evidence. Such plans equip organizations to improve individual, family and community well-being through programmatic interventions, as well as to advocate for local or national policy changes. Students will examine existing programs designed to promote health and well-being in diverse settings locally and nationally. They will learn components of effective program plans and work through a stepwise process to build their own plan for a real or imagined intervention. Prior or concurrent coursework in theory of health behavior or social work and research methods is highly recommended.
Prerequisite(s): COMP 106
Restriction(s):
Can enroll if Class is Junior or Senior

HHS 308  Intro to Macro Social Work  3 Credit Hours
This course provides a foundation for working with groups, communities, and social systems. We will examine macro-level interventions to address planned change in diverse settings. A culturally-sensitive, person-centered approach as well as the NASW Code of Ethics will be integral to the techniques and practices employed in this course. We will utilize a social justice framework throughout the course for exploring issues of inequality, oppression, and equity-focused social change. (F, S, W).
Prerequisite(s): SWK 200 or HHS 210

HHS 309  Theories & Pract. Social Wk.  3 Credit Hours
Full Course Title: Theories & Pract. Social Wk. This course is designed to develop the knowledge and skills necessary for students to begin understanding of the practice of social work. The course provides an overview of general practice and theory. Students are introduced to the value, philosophy and knowledge base considerations of social work practice. Generalist social work practice is presented as a process of planned change with various clients and systems as well as the application of ethical and technical principles of practice. Specific emphasis will be given in this course to the integration of material from the student's knowledge of human behavior, social policy, research, life experience, and professional skills. Lessons and exercises are offered to emphasize understanding and relating to persons of diverse backgrounds including oppressed groups, populations at risk and racial or ethnic minorities. (F,W,S)
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is freshman

HHS 310  System of Care  3 Credit Hours
This course introduces students to the ways that health and human service organizations work individually and collectively to improve the lives of individuals, families, groups, and communities. Health and human services professionals work collaboratively to help persons with a variety of physical, mental, social, emotional, educational, and developmental needs. Systems of care is a service delivery approach that builds partnerships to create a broad, integrated process for meeting clients' and target populations' multiple needs. (YR)

HHS 311  Work w/Vulnerable Populations  3 Credit Hours
Full Course Title: Working with Vulnerable and Hard-to-reach-Populations Successful community-based engagement, outreach activities, and intervention research often involves working with vulnerable and hard-to-reach populations. This course examines some of the personal, social, institutional, legal, and environmental factors that create disparities and vulnerabilities in certain individuals and groups. Underlying theories, effective strategies, and best strategies for working with persons in great need for improved health and the provision of appropriate human services are also presented. (F,W,S)
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is freshman

HHS 312  Family Preservation & Recovery  3 Credit Hours
Current methods for family preservation and helping families cope with family problems are the focus of this seminar style course. Through lectures, written assignments and classroom activities, students learn and practice family intervention technique. Emphasis on families with diverse structures is undertaken and diverse practice settings including home, school, child welfare, mental health, family court, corrections and other community environments are explored in detail. Students are instructed in the special issues in work w/families, e.g. minority status, gender and sexual orientation, disabilities, family violence, trauma and addiction. (F,W,S)
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is freshman
HHS 313  Metro Impact of HHS  3 Credit Hours

Full Course Title: Metropolitan Impact of Health and Human Services
This course focuses on health and human service provision and the impacts of these professions within the metropolitan Detroit area. The course addresses working with multiple populations and multiple service providers. A significant component of the course consists of significant guest speakers who have experience working in this area. The class will often meet off-campus at various social service agencies; students will be responsible for their own transportation.

Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is Freshman

HHS 315  Case Management for Change  3 Credit Hours

Students learn step-by-step processes of case management from intake and initial referral for services, determination of eligibility for services, writing a formal plan for services, case documentation techniques, and techniques for monitoring a client's progress through the service delivery system, to case closure/follow-up activities. The course instructs on access to community resources, interpreting and utilizing information from other professionals, and development of interviewing, intervention, case recording, and caseload management skills. Legal and ethical issues in service delivery are integrated throughout the course. (FW,S)

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 325  Death, Dying, and Bereavement  3 Credit Hours

This course focuses on working with children, adolescents, and families experiencing dying, death, and grief. The course emphasizes the role of families, culture, and healthcare settings, as well as the social meanings of dying and death, developmental perceptions, and the impact of culture, religion, and ethnicity. Specific attention is given to grief reactions in children, the application of developmental level in response to loss, role of human services professionals in clinical and non-clinical settings, as well as the tasks of grief. Strategies and tools relating to communicating with bereaved children, as well as the potential impact on academic, behavioral, and emotional development are addressed. Students will explore and develop familiarity with strategies and tools such as legacy building, memento creation, and the identification and utilization of resources that promote coping skills in relation to death or impending death. (FW,S)

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 336  Perspectives in Women's Health  3 Credit Hours

This course examines women's health issues across the human lifespan, using feminist and sociocultural perspectives. Topics to be explored include the social construction of women's sexuality, reproductive options, health care alternatives and risk for physical and mental illness. Attention to the historical, economic, and cultural factors that influence the physical and psychological well-being of women is an underlying theme. (FW,S)

Restriction(s):
Cannot enroll if Class is Freshman

HHS 350  Comm Organizing for Health  3 Credit Hours

Community organizing is a process by which communities and organizations work together to identify common problems and objectives, acquire and mobilize resources, and create and implement actions to achieve their goals. Community organizing is of interest to sociologists, organization theorists, political scientists, health educators, and social psychologists, among others, as scholars who contribute to our knowledge of working in and with communities. Drawing on these various disciplines and real world case studies, this course examines community organizing theories, models, and principles and how they are used to improve community health and address health inequities. Several practical tools, strategies, and skills are also introduced, including: community assessment, coalition-building, participatory research and evaluation, media advocacy, and policy advocacy. A primary component of this course is the field experience, in which students are partnered with community-based organizations to identify, apply, and reflect on course concepts, while contributing to local community building efforts related to various health issues in the Detroit Metropolitan region.

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 360  Responsible Drug Policy  3 Credit Hours

A study of the fundamentals needed for identifying both the appearance and effects of controlled substances. Students receive guides to controlled substances; their color, trade names and drug codes. Topics include a critical examination of the physiological, sociological and legal aspects of drug abuse and the many complexities which have developed as a direct or indirect result of drug policy in society. (OC)

HHS 364  Health Policy and Admin  3 Credit Hours

A survey of the structure and processes of health administration in America, including analysis of current issues in health policy.

HHS 370  Medicine and Addiction I  3 Credit Hours

Medicine and Addiction I is part one in the sequence of introductory coursework in the Addiction Studies Certificate Program. This course provides the clinical orientation for addiction that frames much of the activities associated with screening and assessment of client behaviors as well as aspects of intervention and management of clients with addiction. Students successfully completing the course will identify and apply the assessment principles for individuals and families dealing with addiction. (OC)

HHS 371  Medicine and Addiction II  3 Credit Hours

Medicine and Addiction II is part two in the sequence of introductory coursework in the Addiction Studies Certificate Program. This course provides the clinical orientation for addiction that frames much of the activities associated with screening and assessment of client behaviors as well as aspects of intervention and management of clients with addiction. Students successfully completing the course will identify and apply the treatment principles for individuals and families dealing with addiction. (OC)

Prerequisite(s): HHS 370 or HPS 370

HHS 380  Religion, Medicine, and Health  3 Credit Hours

This interdisciplinary discussion course examines topics and research methods in the historical, sociological, psychological, and anthropological intersections between religion, medicine, and health for its effects on the understanding of illness and disease, health agency, death and dying, and other aspects of the illness experience. (YR)

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
HHS 400  Health Policy and Politics   3 Credit Hours
This course will examine the politics of the health policy process, through a critical review of the roles, relationships, motivations, and strategies of key political actors, structures, and institutions that comprise the policymaking process in the United States. The objective is to prepare students to serve as effective policy or political advocates. We will review and discuss conceptual models of policymaking and politics in order to contextualize real-life health policy processes and decisions. (YR)
Prerequisite(s): HHS 300

HHS 401  Methods of Health Promotion   3 Credit Hours
This course is designed to prepare students with skills necessary to implement health education programs within the context of community health settings. Emphasis will be placed on a variety of community health education methods and strategies including but not limited to educational presentations and material development, mass media and media advocacy, legislative action and involvement, community organization, and working with groups. (F, W, S)
Prerequisite(s): CHE 101 or HHS 101 and CHE 201 or HHS 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 402  Health & Human Svcs Internship   3 Credit Hours
This internship provides students the opportunity to apply classroom learning and gain hands-on experience inside a public health work environment at the Michigan Department of Community Health. The experience allows students to build valuable networking connections with local and state public health professional leaders as well as explore a career choice within public health. The course focuses on exposure to state and local program analysis while students develop marketable job skills and core public health competencies. (F, W, S)
Prerequisite(s): CHE 101 and HHS 200
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 403  Medical Information Systems   3 Credit Hours
Medical Information Systems deals with how information is created, stored, and used in health care settings. Areas of interest for this course include fundamentals of computers and data management, medical information documentation in the form of paper and electronic medical records, health data privacy issues, disease classification and scoring systems, quality assurance in health care delivery, commonly used health care statistics, reimbursement methodologies, health care monitoring by internal processes and external review agencies, and vital statistics and disease surveillance systems. The course also includes some hands-on computer applications instruction to familiarize students with commonly used software platforms utilized in health care administration. (F, W, S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 404  Financing Health & Medical Sys   3 Credit Hours
The American health care system faces two problems: access to health services and high and rising costs. This course looks at the problems of uninsured citizens as well as the strains placed on health care facilities in providing services for them. Europeans have dealt with problems of access and cost controls through universal health care coverage and the course takes up various models in use today. The course also looks at American health insurance and "managed care" programs such as HMOs and PPOs as methods of providing health coverage as well as controlling costs. The course introduces students to services provided by the government including Medicare, Medicaid and State Children's Health Insurance Program (SCHIP). Students will learn the basics of creating a budget under constraints such as contractual limitations and Diagnosis-Related Groups (DRGs).
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 405  Population Health   3 Credit Hours
Population Health is defined as encompassing the health outcomes of a group of individuals as well as the distribution of those outcomes as related to the social determinants of health. Lectures, discussions, and group exercises focus on the impact of composite indicators in relation to population health including medical and health care, policy, genetics, behavior, social structures, and environmental factors. (F, W)
Prerequisite(s): HHS 200 or CHE 101
Restriction(s):
Cannot enroll if Class is Freshman

HHS 406  Program Evaluation   3 Credit Hours
This course will provide an introduction to key concepts in program evaluation. Students will learn about the systematic steps involved in evaluating public programs for efficiency and effectiveness. The course will rely on case studies, text examples, and discussion.

HHS 407  Fundraising & Grantwriting   3 Credit Hours
Full Course Title: Fundraising & Grant-writing in Health & Human Services
This course introduces students to the ways that health and human service programs secure resources to expand and improve their services, reach vulnerable or marginalized populations, and address existing or emerging social conditions. The primary focus of the course is on the development of grantseeking skills, but students will also gain exposure to a variety of fundraising approaches that may be relevant over the course of their career. Students will learn components of effective grant proposals and gain technical knowledge on designing supporting fundraising documents, such as budgets and project timelines. Students will work through a stepwise process to build their own grant proposal for a real or imagined program. Recommended prerequisites include HHS 360 and/or HHS 460. (YR)
Prerequisite(s): COMP 106
Restriction(s):
Can enroll if Class is Junior or Senior

HHS 410  Quantitative Research & Stats   4 Credit Hours
Full Course Title: Statistics in Health and Human Services
An introduction to methods of data collection and analysis. Elementary statistical data are analyzed using computerized statistics programs. A discussion of research design and the philosophy of social science applied to answering health and human service questions.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
HHS 412 Principles of Epidemiology  3 Credit Hours
The study of the frequency and distribution, as well as the causes and control, of disease in human populations. Using data analysis tools, one can identify causes of disease and the effects of prevention and treatment. This course is an application of research design to determine the extent of which environment (toxins, for instance), heredity, childhood development, and lifestyle influence morbidity and mortality rates. (F,W,S)
Prerequisite(s): SOC 410 or HPS 410 or HHS 410 or CRJ 410
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 415 Healthcare Administration  3 Credit Hours
This course introduces students to administrative models and skills that can be used at a supervisory level. These conceptions include strategic planning, marketing, organizational communications, quality assurance, project management and team skills, supervision and evaluation, conflict resolution and office cultures and policies. A critical and historical perspective is used to understand the origins and meanings of these conceptions and the extent to which they correspond with the service mentality of health and human services. Applications to the health and human services will be central to the course. (F,W,S)
Prerequisite(s): HPS 440 or HHS 440
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 425 Work w/Child in Health Setting  3 Credit Hours
Full Course Title: Working with Children in Healthcare Settings
This course is essential for students interested in working in health care settings, with children or pediatric populations, and in particular for persons seeking to become a Certified Child Life Specialist. The course is taught by a Certified Child Life Specialist and focuses on children in the health care environment. Topics of study include: Child Life documents, scope of practice, impact of illness, injury and health care on patients and families, family-centered care, therapeutic play and preparation. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 430 Hlth Behavior & Hlth Education  3 Credit Hours
This course provides an overview of social and behavioral science theories that guide the development of health education and promotion interventions aimed at preventing, reducing, and eliminating public health problems. Part one of the course describes the relationship between behavior and health, through a review of several current health problems faced by people in the United States. Part two presents a survey of health behavior theories ranging from those aimed at individual behavioral change to community health education promotions. The final part of the course looks at the application of theory to real-world health promotion and education interventions. Students will learn how social and behavioral theory informs intervention design, implementation, and evaluation. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 433 Race/Ethnic Health  3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health
This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequity-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy. (OC)

HHS 435 Obesity and the Lifecourse  3 Credit Hours
This course aims to introduce students to the fundamentals of the lifecourse perspective on health, while using “obesity” as a unifying example to illustrate its theoretical linkages to individual and population health. The practical implications for the administration and financing of the health care system, and for framing policy options. The course highlights the differential impact of obesity on (1) the health and socioeconomic achievement of individuals at various stages in the lifecourse; (2) the population health and economic needs or opportunities, as derived from the lifecourse profile of a specific population (i.e., age distribution and aging trends) and in the context of a changing structure of society; and (3) the demand for healthcare services and other stressors on the healthcare system. The course identifies the rationale, goals, scope, design, and potential for successful implementation of obesity-reducing policy interventions at different points during the lifecourse. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 436 Reproductive Health Policy  3 Credit Hours
This course provides a comprehensive introduction to the field of reproductive health in the US. Understanding women’s reproductive health requires consideration of the intersections of gender, race, class, culture, geography, economic status, and nation within a sociopathological context. The course introduces students to the historical trends in the regulation of women’s fertility and reproductive health. Readings draw from a number of different disciplines, including: law, medical studies, history, social sciences, and personal narratives to critically examine the intent and impact of current standards for reproductive health policy and practice. Topics include: reproductive justice, contraception, pregnancy, reproductive control, and family leave. Course discussions include a focus on health policy and activism to affect change related to women’s reproductive health, all within a framework of reproductive justice. A major emphasis is on developing critical thinking skills that can be applied to issues of women’s reproductive health in order to educate and empower students to become proactive healthcare consumers. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 440 Medical Sociology  3 Credit Hours
An analysis of health and illness behavior from the point of view of the consumer, as well as medical professionals, the structure, strengths and weaknesses of the medical care delivery system in the U.S.; the impact of culture and personality on illness behavior, and a study of the institution of medicine and activities of health care professionals.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
HHS 442 Medical Ethics 3 Credit Hours
An examination of moral issues in medicine. Among the problems to be considered are truth-telling and paternalism in the doctor-patient relationship, psychosurgery and behavior control, death and euthanasia, the allocation of scarce resources, and genetic counseling and control. Specific attention will be given to ethical theories and to philosophical concepts such as rights, autonomy, and justice.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 340 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 445 or PHIL 485 or PHIL 490
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 448 Comparative Health Care System 3 Credit Hours
An introduction and overview of the English, Swedish, and People's Republic of China health care systems. Focus on cultural and other organizational characteristics, unique features, approaches, and ability to solve problems. Emphasis on how these systems help us understand the American health care system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 456 Health Care and the Law 3 Credit Hours
A comprehensive study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children's rights, access to health care. The emphasis will be on the organizational and personal consequence of legal requirements. Junior/Senior standing is a requirement. Students cannot receive credit for both HHS/HPS 456 and HHS/HPS 556.
Prerequisite(s): SOC 201 or SOC 200 or POL 364
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 470 Information Science and Ethics 3 Credit Hours
Technological innovations in how individuals, organizations, and governments collect and share personal information have raised myriad concerns regarding how that information can be best protected. In today's highly networked world, individuals must acquire the knowledge and skills to engage with technologies in a safe and secure manner. This course provides an interdisciplinary exploration of the social, legal, ethical, and design challenges that arise when it comes to securing personal information and helping individuals maintain desired levels of privacy at home, work, and everywhere in between. (YR)
Prerequisite(s): MATH 115 and MATH 116 and (MATH 227 or MATH 217) and (MATH 205 or MATH 215) and CIS 150 and CIS 200 or CCS 200 or IMSE 200

HHS 475 Soc Construct Mental Illness 3 Credit Hours
Full Course Title: Social Construction of Mental Illness This course explores varied cultural descriptions and models of mental illness. By focusing on the ways that culture shapes how people experience, and respond to, mental illness this class explores cultural representations of mental illness, ranging from discrete illness resulting from a chemical imbalance to a profound threat to order. We seek to understand the cultural, personal, and political underpinnings of mental illness and medical practices in societies throughout the world. The course utilizes an interdisciplinary perspective, drawing from multiple sources of information regarding mental health issues including feminism.
Prerequisite(s): SOC 200 or SOC 201 or WGST 303 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303

HHS 480 Arab American Health 3 Credit Hours
This course explores health issues, practices, risk factors, and disease in the Arab world and MENA region, as well as in Arab American communities in the United States and in the State of Michigan. The course focuses on the interaction of culture, geography, and health in the Arab world and the impact of cultural commonalities on the health of the generations of Arab immigrants to the United States. (W)

HHS 490 Topics in Health 1 to 3 Credit Hours
Examination of problems and issues related to Health. Title as listed in Schedule of Classes will change according to specific content. Course may be repeated for credit when specific topics differ.

HHS 490C Topics in Health 3 Credit Hours
This course provides an overview of health education efforts with women and families, informed by a Maternal and Child Health framework and a life course perspective. Students successfully completing the course will be able to: 1) describe the field of maternal and child health, 2) describe health issues prevalent among both women of childbearing age and children, 3) understand interventions developed to address maternal and child health, and 4) understand how women are engaged in health education efforts targeted to women, children and men. This course will also provide students with means of applying principles in maternal and child health and the life course perspective in health education practice. This course is appropriate for students in Community Health Education, Public Health, Child Life, and Health Policy Studies.

HHS 491 HHS Senior Seminar 3 Credit Hours
Focus on current issues and practical problems faced by persons working in public health, health care organizations, human services delivery, and financing. Use of the case method (where appropriate) to demonstrate and discuss real problems and approaches in functioning institutions in Southeastern Michigan. Taught primarily from the point of view of individuals responsible for administering or advising such institutions. (F,W,S)
Prerequisite(s): HPS 440 or HHS 440 or HPS 336 or HHS 336 or HPS 364 or HHS 364 or HPS 390 or HPS 401 or HHS 402 or HPS 403 or HPS 404 or HHS 404 or HPS 405 or HHS 415 or HPS 410 or HHS 410 or HPS 412 or HHS 412 or HPS 430 or HHS 430 or HPS 442 or HHS 442 or HPS 448 or HHS 448 or HPS 456 or HHS 456 or HPS 475 or HHS 475 or HPS 498 or HHS 498)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior

HHS 495 Off-Campus Research 1 to 3 Credit Hours
Participation in ongoing research, and/or field experience at an off-campus laboratory, clinical, health, healthcare facility, or field site. Arrangements are made between the site, the student, the pre-health advisor, faculty member, and/or the academic advisor(s). Four to twelve hours laboratory or site experience attendance per week. Permission of advisor required. (F,W,S)

HHS 498 Independent Study 1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. (F,W,S)

HHS 499 Independent Study 1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. (F,W,S)

Other Content
* An asterisk denotes that a course may be taken concurrently.
History (HIST)

HIST 101  The World to 1500 CE  3 Credit Hours
This course is an introductory survey of world history from the close of the Ice Age to the beginnings of globalization, ca. 1500 CE. We will compare world civilizations and examine the connections among them.

HIST 102  Medieval and Renaissance World  3 Credit Hours
An introductory survey of world civilizations from c.1000 CE to 1750 CE. The course explores global patterns of trade, technology and expansion, the role of geography, climate and catastrophe in shaping human societies, and the relationship between warfare and the rise of the nation state. Topics include the rediscovery of classical traditions in the Renaissance, the rise of the Gunpowder Empires in Asia and the Middle East, and cross-cultural interactions between the European West and the American 'New World'.

HIST 103  The World Since 1500 CE  3 Credit Hours
This course is survey of world history since 1500 CE. It emphasizes global social, political and economic trends, including the impact of nationalism, imperialism, industrialization, dictatorships, and democratic institutions.

HIST 104  Chinese Civilization  3 Credit Hours
A broadly based introductory study of China that exposes the student to a culture very different from our own and helps that student to understand Chinese institutions and values. It explores essential elements of Chinese civilization in comparative reference to the development of western civilization. Recommended for freshmen and sophomores. (YR).

HIST 105  Japanese Society and Culture  3 Credit Hours
A survey of Japanese society and culture in the traditional and modern periods, treated within the comparative framework of the history of the western world. It examines the development of cultural traditions under Chinese influence and the subsequent interaction with modern western nations. Recommended for freshmen and sophomores. (YR).

HIST 106  An Intro to the African Past  3 Credit Hours
Survey of the social, economic, political, intellectual and cultural heritage of the African peoples from prehistory to the present. Emphasis on internal dynamics of African society through five millennia, as well as the impact of external forces on African life. Themes of particular interest: the roots of African culture, the trans-Atlantic slave trade and the African diaspora in the New World, the European Conquest, and the character of the colonial order and the ongoing struggle to end the legacy of alien domination. (YR).

HIST 108  Latin America: The Colonial Era  3 Credit Hours
This course will examine the colonial period in Latin American history from the Spanish and Portuguese contact and conquest to the early nineteenth-century wars for independence. It will focus on the background of European colonization, the process of interaction between Natives and Europeans, the growth and development of colonial society, the shifting uses of land and labor, and the roots of the nineteenth-century revolutionary movements. (OC).

HIST 109  Latin America: The Modern Era  3 Credit Hours
This course examines the modern era in Latin American history from the early nineteenth-century wars for independence to the present day. The course will focus on the formation of the Latin American states, the development and growth of Latin American culture and society, the legacy of slavery, the transition to capitalism in the region, the growth of export economies and dependency, and the rise of nationalism and revolutionary movements in the region. (OC).

HIST 111  The American Past I  3 Credit Hours
A survey of the economic, social, and political developments in America from the colonial era to the Civil War.

HIST 112  The American Past II  3 Credit Hours
A survey of the economic, social, and political developments in America from the conclusion of the Civil War through the present.

HIST 290  Topics in History  3 Credit Hours
Problems and issues in selected areas of history. Title listed in Schedule of Classes changes according to content. Courses may be repeated for credit when specific topics differ. (OC).

HIST 291  Topics in History  3 Credit Hours
Problems and issues in selected areas of history. Title listed in Schedule of Classes change according to content. Courses may be repeated for credit when specific topics differ. (OC).

HIST 300  The Study of History  3 Credit Hours
A study of the theories of historical analysis, styles of historical writing, and approaches to historical research. For history majors who should elect it as soon as they declare their concentration. (F,W).

HIST 302  Russian Intellectual History  3 Credit Hours
Examines the historical myths that supported traditional Russian institutions, the literature that expressed these myths in symbolic form, the relationships between the social classes, and the conflict of values and goals in 19th-century Russia. Through the literature of the period the course explores social, intellectual, and political movements. The material is organized to consider both revolutionary and reactionary ideologies, origins of each, and the dynamics between them. (AY).

HIST 303  The Birth of Civilization  3 Credit Hours
Course examines the nature of the intellectual structure of the ancient Egyptians, Mesopotamians and Hebrews, and the social structures and historical developments of those cultures. Emphasis is on the evolution of civilization, the contrasts between Egypt and Mesopotamia, and most importantly, the shifts from mythical to philosophical thinking and discourse. (OC).

* An asterisk denotes that a course may be taken concurrently.
HIST 304  Studies in Det. Hist & Culture  3 Credit Hours
This interdisciplinary course explores the political, social, and cultural history of Detroit by examining ways various groups and classes have interacted with and been shaped by structures of power and influence. The course highlights trade and commerce, newcomers, and the influence of organizations and institutions within the contexts of labor, race, ethnic, and religious histories and current affairs, and examines how these fit into the evolution of Detroit from the 19th century to the present. Where pertinent the influence of national and international movements included.

HIST 305  The Arts & Culture of Detroit  3 Credit Hours
This interdisciplinary course explores the modern and contemporary cultural history of Detroit, examining the ways in which various population groups have been creative from the nineteenth century to the present. The course highlights the work of architects, designers, photographers, visual artists, poets, and musicians, and situates them in the broader cultural context of American art and history.

HIST 306  20th-C Russian Intel History  3 Credit Hours
Study of the relationships between revolutionary philosophies and actions; the dilemma of the Russian Revolution and the dilemma of its "success", the interaction of art, literature, and revolutionary movements. The course examines historical developments through novels, poetry, and philosophy. (AY).

HIST 307  Early Russian History  3 Credit Hours
A history of Russia from its prehistoric origins to the beginning of the 19th century, focusing on political and economic development, cultural and religious dynamics, foreign relations, and expansion in Asia. Stress is placed on political dynamics, including the forces of democracy in Russia's past. (AY).

HIST 308  Imperial Russia  3 Credit Hours
A history of Russia from the time of Peter the Great to the Russian revolutions of 1917. Attention is given to internal affairs, economic development, foreign relations, the failure of reforms, and the emergence of the revolutionary movement. (AY).

HIST 3085  History Internship  3 to 6 Credit Hours
The internship offers students experience in types of work available to liberal arts graduates. Regular meetings between the Internship Coordinator and the intern are required. Students can count up to 3 credits of History Internship (HIST 3085) as an upper-level history course in the degree requirements for the history major.

HIST 309  The Russian Revolutions  3 Credit Hours
Provides a broad overview of Russian history leading to the Russian revolutions of 1917, and a more detailed analysis of the revolutions of 1905 and 1917 and the subsequent development of the Soviet Union up to the present. Roots of present Soviet behavior will be sought in Russia's past. (AY).

HIST 3121  Polish History Since 1800  3 Credit Hours
This class offers students a chance to study 19th and 20th century Polish history. We look at how the most prominent ideals of what it means to be Polish – framed as a discussion between the Romantics and Positivists; the Fighters/Insurgents and Realists; the Old and New – affected the perceptions on honor, heroism, and Polish patriotism. A critical evaluation of these models leads us to evaluate the most important historical events in the last two centuries of Polish history – a country with impressive history of openness and multiculturalism as well as grim chapters of xenophobia. Centered on the role of individuals in shaping history, this class also reflects on the identity of Poles – citizens of a country located at the cross-roads of Eastern and Western Europe.

HIST 3122  Poland - Study Abroad  3 Credit Hours
This is an interdisciplinary course led in major Polish cities. The trip begins in Kraków, and then continues to Warsaw, Łódź, and Gdańsk. While there, the class will explore various and often conflicting, aspects of Polish and Polish-Jewish history. Visits to these historical sites will be accompanied by appropriate primary and secondary source readings and documents. During the course of the trip, students are expected to actively participate in ten scheduled seminar meetings as well as numerous lectures and workshops with local historians. While on the trip, students will have the opportunity to experience Polish culture; traveling on local transportation, sleeping in local hostels and hotels and eating in local cafeterias and various eateries.

HIST 3125  Modern East-Central Europe  3 Credit Hours
This class offers introductory knowledge about the history of 19th and 20th century East-Central Europe – often called the lands-in-between – in particular Poland, Hungary, Czechoslovakia, and Romania. It helps us understand major European phenomena from the perspective of smaller European states. We will focus on important historical moments, ideologies, and concepts that formed the area and affected the local identities.

HIST 3130  Armenia Ancient Medieval World  3 Credit Hours
The course is a general survey of Armenian history and culture from the pre-historic period to the early sixteenth century, with emphasis on Armenia's political, economic and cultural interrelationships with other countries and peoples in the Near and Middle East, Europe and Central Asia. The course analyzes how the major political and demographic shifts in world history impacted Armenia and the Armenians. Each era of Armenia history is discussed in terms of developments in the surrounding countries. Attention is given to politics, international relations, trade, religion, literature, art, and architecture.

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3131  Armenia in the Soviet Period  3 Credit Hours
HIST 3131 will study the history of the Soviet Republic of Armenia, when it was ruled by Communists and was part of the USSR in 1920-1991. It will chronicle the broad political, economic, social and cultural developments throughout 70 years of Soviet history and will then study in detail how these developments affected life in Armenia, one the fifteen union republics of the USSR, and relations between Soviet Armenia and the Armenian Diaspora outside the USSR, including the Armenian American community. The course will help students to better understand the Soviet experience by focusing on developments not only in the political center in Moscow, but in the southernmost and territorially the smallest of all the Soviet republics. It will also help students to better comprehend the historical background to some contemporary developments in Transcaucasia (the South Caucasus), Turkey, Iran and the Arab states of Western Asia.
HIST 3132 Armenians in the Modern World 3 Credit Hours
The course is a general survey of Armenian history and culture from the early sixteenth century to the present, with emphasis on political, economic and cultural interrelationships with other countries and peoples in the Near and Middle East, Europe and the Americas. The course analyzes how the major political shifts in world history impacted Armenia and the Armenians. Therefore, each era of Armenian history covered in this course is discussed in terms of developments worldwide and especially in the surrounding countries. Studying Armenia and the Armenian people gives students an understanding of what happens to, in, and around small countries as they find themselves in a regularly changing international political environment. Attention is given to politics, international relations, economics, religion, literature, art, and architecture. Modern Armenian history and culture is discussed in relation to Ottoman, Iranian, Russian, West European, North America, and other civilizations.

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 314 England: Tudors and Stuarts 3 Credit Hours
A political, economic, and social survey of England from 1485 to the end of the 17th century. Focus is on the interrelation of society and politics as well as on the rise of England to major international status. (AY).

HIST 315 Modern Britain 3 Credit Hours
Course focuses on Great Britain from the time of the Industrial Revolution to the present. Major problems considered are industrialization, the British empire and its disintegration, the democratization of British political life, the creation of the welfare state, and Britain's role in the contemporary world. (AY).

HIST 316 African American History 3 Credit Hours
This course traces the experience of African Americans from their first landing in Virginia in 1619 through slavery and the Civil War. Emphasis will be placed on the origins of racism, the development of the slave system in the United States and the historical developments that led to the Civil War. (YR).

HIST 318 Early American Republic 3 Credit Hours
This course examines the history of the United States from the ratification of the Federal Constitution through the Presidency of Andrew Jackson. Particular attention is given to the process of political party formation, the impact of the "market revolution" upon life, the origins and ramifications of the Second Great Awakening, the antebellum reform movements, and slavery. (YR).

HIST 319 Civil War & Reconstruction 3 Credit Hours
This course examines America's pivotal middle period, a period of rising sectional tensions, bloody civil war, and protracted debate about the promise and limits of equality in the United States. Among the topics covered are the meaning of freedom in antebellum America, territorial expansion and the development of slavery as a political issue, the collapse of the national party system and the secession crisis, the meaning of the American Civil War, and the postwar settlement of reconstruction. (YR).

HIST 321 Late Imperial China 3 Credit Hours
Explores key issues in Chinese society and culture from around 900 CE to around 1800 CE, considering demography, family life and lineage organization, gender relations, farming and handicraft industries, intellectual trends, ethnic relations, popular culture, education, social stratification, and social control under imperial bureaucracy. (AY).

HIST 3211 Untold Caribbean: Field Course 3 Credit Hours
Full Course Title: Dark History and Untold Stories: Field Class in Caribbean Historical Archaeology. Field Class: involves international travel and required costs in addition to tuition. This class explores the story behind Caribbean "paradise." We use the analytical methods of historical archaeology to "read" sites of enslavement and resistance, as well as modern museum interpretations of Caribbean heritage, and engage in the production of new archaeological knowledge through excavation. We will ask how negative or "dark" history should be remembered, what life was like on Caribbean plantations, and how histories of slavery are relevant now. Throughout, we will examine how archaeology can tell the untold stories of the many people-black, white, free, and enslaved-who never made it into the history books. We will also contribute new voices with a "mini-field session" of archaeological excavation: students can gain a glimpse into scientific archaeology, and get to try out fieldwork to see if they would gain from a full field school. (S,OC)

HIST 322 Traditional China 3 Credit Hours
Examines Chinese history from ancient times to around 900 CE, stressing key developments in society, culture, and government that produced enduring cultural traditions, bureaucratic government, and distinctive patterns cultural exchange in Eastern Eurasia. (AY).

HIST 323 History of Modern China 3 Credit Hours
Studies China's historical evolution from around 1800 to recent events in the People's Republic; assesses China's distinctive path to modernity from traditional ideals and patterns of order, including demographic transformations, Western impact, rebellions and wars, nationalism and revolutions, and recent economic growth and social change. (YR).

HIST 325 Traditional Japan 3 Credit Hours
Traditional Japan from ancient times to around 1800; emphasis is placed on the evolution of Japanese institutions under the cultural influences of China. (AY).

HIST 326 Modern Japan 3 Credit Hours
Japan from around 1850 to present. The course considers the impact of foreign contacts on the Tokugawa system, the emergence of Japan as a modern state, Westernization and nationalist reaction, the rise of militarism, the Pacific War, economic growth and social changes after the war, and changes in the U.S.-Japan relations. (OC).

HIST 329 Medieval Society 3 Credit Hours
An analysis of social institutions and ideas from the High Middle Ages through the discussion of original sources. (AY).

HIST 330 The Renaissance 3 Credit Hours
This interdisciplinary study of Renaissance culture focuses on its preeminent center, Italy, in the 15th and 16th centuries. The course investigates major aspects of art, music, literature, and philosophy and their relationships to social, economic, and political structures.

HIST 331 The Reformation Era: 1500-1648 2 to 3 Credit Hours
A study of the nature, course, and impact of the Protestant Reformation in Europe, Humanism, the Counter-Reformation, and the cultural and social implications of Protestantism also receive attention. (YR).

HIST 333 Europe in Age of Rev:1750-1815 3 Credit Hours
History of Europe during a period when established patterns of thought, social structure, and institutions were violently challenged. (AY).

Prerequisite(s): HIST 365
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
HIST 334  Europe in Age of Imp:1815-1914  3 Credit Hours
Europe in the age of nationalism, industrialism, imperialism, and democracy; background and origins of World War I. (YR).

HIST 335  20th-Century Europe, 1890-1945  3 Credit Hours
Europe before, during, and after World War I; the rise of communism and fascism; World War II. (AY).

HIST 336  The Contmp World, 1945-Present  3 Credit Hours
The post-war world, U.S.-Soviet rivalry, European/Japanese renaissance, the Chinese Revolution; decolonization and the emergence of the Third World. (OC).

HIST 3368  Germany Since 1945  3 Credit Hours
This course covers the history of Germany since World War II. It examines 1) the postwar period and the legacy of Allied occupation; 2) the process by which Germany was divided and the period of its division, tracing the histories and divergent characters of East and West Germany; 3) the different ways in which both the Cold War context and the legacy of the Third Reich shaped the German experience of twentieth-century revolutions of society, culture, and sexuality; 4) Germany's re-unification after 1989; and, finally, 5) the subsequent challenges in identifying a newly united but increasingly multicultural Germany's place in a unified Europe, focusing on issues of immigration, national identity, and citizenship.

HIST 337  Islamic Movemnts Mid East Hist  3 Credit Hours
Will compare several Islamic movements in Middle Eastern history, starting with the rise of Islam in Mecca and Medina. Later impulses toward Islamic revival all looked back to the first movement, and hoped to capture both its spirit and its success. With this as background, the course will move to address two questions: How did later Islamic movements understand the history of the rise of Islam? How have later Islamic movements had to adapt their methods and their ideology to different historical circumstances? (AY).

HIST 338  Women&Islam Mid East to 1900  3 Credit Hours
This course covers the historical development of Islam's normative stance towards women and gender roles in the Middle East from the rise of Islam to the earliest stirrings of feminist activism.

HIST 3380  The European City, 1750-2000  3 Credit Hours
As a novel form of social and spatial organization, the rise of the modern industrial city transformed the European landscape. This course tracks the growth and development of the city in modern Europe, focusing particularly on London, Paris and Berlin. The course considers the physical landscape of the industrial city and the infrastructural challenges of rapid urbanization, political revolution, the exercise of political power and social control in urban space, as well as intellectual and artistic responses to the urban environment. In the final two units of the course we consider 20th-century challenges to the model of urban modernity that has carried over from the nineteenth century, and which remains so powerful today.

HIST 3385  Sex, War, and Violence  3 Credit Hours
Full Title: Sex, War, and Violence: Gender and Sexuality in the 20th Century European History. This course centers the often overlooked role of gender and sexuality in the 20th century European mobilizations of state violence such as the Holocaust, Armenian Genocide, and conflicts in the former Yugoslavia. It emphasizes the clashes that occurred between gains in gender and sexual rights during the century and projects of state violence that were frequently aimed at dismantling these gains. Attention is paid to the intersection of race, class, religion and gender in the (re)construction of new gender and sexual hierarchies in conflict and post-conflict contexts in the region. (OC)

HIST 339  Ottoman Empire in 19th Century  3 Credit Hours
The course is general survey of the history of the Ottoman Empire from the treaty of Kucuk Kaynarca in 1774 until the abolition of the caliphate in 1924. The course will examine such topics as modernization; imperialism; the rise of ethnic nationalisms among the empire's Christian and Muslim subjects; decocracy; ideologies like Ottomanism, pan-Islamism, Islamic modernism, and pan-Turkism; and changing ideas about gender.

HIST 3390  20th c European Women's Hist  3 Credit Hours
This course focuses on selected events on the 20th century that illustrate the defining experiences of women in both Western and Eastern Europe. These include women's war experiences, women and 20th century ideologies (e.g., communism, nationalism, and fascism), women and the welfare state, and the state control of women's bodies.

HIST 340  Freud's Vienna: 1866-1920  3 Credit Hours
An analysis of the place of Vienna in the cultural history of the modern west; particular attention is given to the Vienna of Franz Josef (1848-1916) through the disciplines of history, art, architecture, music, literature, philosophy and psychoanalysis. Included are works by Freud, Schnitzler, Kraus, and Zweig. (AY).

HIST 341  Hist, Lit, & 20th Century Iran  3 Credit Hours
This course will examine the formation of modern Iranian culture through both historical documents and the creative works of mainly 20th Century Iranian poets and authors. The focus of the course will be the period between Iran's Constitutional Revolution of 1905-1906 and the revolution of 1977-1979.

HIST 343  Germany Before Hitler  3 Credit Hours
This course considers the history of Germany in the nineteenth and early twentieth centuries. Topics covered include the changing nature of German national identity, the creation and fall of the German Empire, German colonialism, immigration, World War I, and the Weimar Republic. We will also consider how trends in German politics and culture helped prepare the ways for Hitlers radical, racist version of German nationalism. (AY)

HIST 344  West Africa Since 1800  3 Credit Hours
A history of the West African peoples since 1800, which focuses on their unique cultural heritage. Themes include: West Africa before the advent of alien domination, the European Conquest, West Africa under the Colonial regimes, and the liquidation of colonial rule and the reassertion of West African independence. (AY).

HIST 345  Thomas Edison and his Era  3 Credit Hours
This course will introduce students to the life and work of Thomas Edison. Breaking with the stereotype of the lone inventor/genius, we will examine how Edison helped shape and was in turn shaped by the context of the Gilded Age America - when the United States emerged as an urban, industrial nation. Lectures and discussions will be supplemented by slides, films, and visits to the Edison-related sites at the Henry Ford. Throughout the course the following themes will be explored: invention and the labor process, the significance of manufacturing and marketing, and the origins of modern consumer culture. (OC).
HIST 3502  The Middle East 570 to 1800 CE  3 Credit Hours
This course covers the social and political history of the Middle East from the rise of Islam through several key transformations to 1800. We will examine the Middle East as the center of caliphal empires, as a place of political fragmentation, as a home to increasingly diverse ethnic and religious groups, as a region within an expanding Islamic world, and as the domain of the three so-called "gunpower empires" (the Ottoman, Safavid, and Mughal dynasties). (YR)
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40

HIST 3511  Modern Middle East, 1918-1945  3 Credit Hours
This course surveys the history of major political events and social changes in the Middle East from 1918 to 1945. Among the topics covered are the struggle of Arab States for independence, the rise of Kemalism, and the rise of the Pahlavi Dynasty.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3512  Modern Middle East, 1945-1991  3 Credit Hours
This course surveys the history of major political events and social changes in the Middle East from 1945 to 1991. Among the topics covered are the "Arab Cold War," the Palestinian-Israeli conflict, the struggle for democracy, and the resurgence of "Islamist" politics.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3520  Lebanon in Modern Middle East  3 Credit Hours
HIST 3520 studies the modern history of Lebanon and the country's involvement in broader Arab and Middle Eastern politics from the period when Lebanon's modern boundaries were established in 1920 to 2005 when Syrian troops were forced to leave the country. The course focuses on the relations of the Lebanese state, its various ethno-confessional communities and political groupings with the Great Powers like France, the United Kingdom, the Soviet Union and the United States of America, as well as with the influential Arab states in the region, in particular Egypt, Syria, Saudi Arabia and Iraq. Particular attention is paid to the impact of the Arab-Israeli conflict and the presence of Palestinian refugees on internal Lebanese politics. The course also analyzes the diverse, sometimes contrasting, visions among Lebanon's various local elites towards the country's place in the region and the world and how these visions underwent change in light of evolving internal social and external political developments. (YR)

HIST 354  The United States and Vietnam  3 Credit Hours
The Vietnam War was a major turning point in U.S. history. This course focuses on French rule in Indo-China, U.S. interests in the region; U.S. involvement after 1945; the military, economic, and social nature of that intervention; and the consequences of the war. (OC)

HIST 355  Eng Colonies in Amer, 1607-1763  3 Credit Hours
European expansion into North America; colonial societies, ideas, and institutions; imperial policy and administration, and accompanying changes in Amerindian and African cultures, and New World ecologies. (YR)

HIST 356  American Revolution, 1763-1815  3 Credit Hours
The causes, character, and consequences of the American Revolution, and the shaping of a new nation through the War of 1812. (YR)

HIST 358  Emerg of Modern U.S., 1876-1916  3 Credit Hours
An intensive study of the history of the United States from the end of Reconstruction to America's entry into World War I. Particular attention is paid to the social, economic, and intellectual aspects of the period and to the origins of 20th-century America. (OC)

HIST 359  Era of World Wars: 1916-1946  3 Credit Hours
An intensive study of the history of the United States from 1916 to 1946. Topics include World War I and its aftermath, the Depression, the New Deal, World War II, and post-war settlements and problems. (AY)
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280

HIST 360  The U.S. Since 1946  3 Credit Hours
This course focuses on the era bracketed by the Truman through the present administrations. Particular attention is given to the New Deal, the Truman policy of containment, the Cold War, relations with China, McCarthyism, the Korean war, the civil rights movements, the New Frontier, involvement in Vietnam, and the problems of contemporary America. (AY)

HIST 3601  Michigan History  3 Credit Hours
This course covers some of the major trends and developments in the history of the state of Michigan from its aboriginal past to the present day. The course will focus upon placing the state's history within a broader national and international context and will focus upon such topics as aboriginal settlement and culture, colonization, American settlement and statehood, industrialization, immigration and political development. (YR)

HIST 3602  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas unifying America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience. (OC)
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280
Restriction(s):
Can enroll if Level is Undergraduate

HIST 361  United States Economic History  3 Credit Hours
A survey of the processes of development of the United States economy, their social implications, and the sources of today’s economic problems. (F)
Prerequisite(s): ECON 201 and ECON 202

HIST 362  Eur and Internl Econ History  3 Credit Hours
A survey of the processes of industrialization in the major non-American industrial economies, with a focus on their relevance and implications. (AY)
Prerequisite(s): ECON 201 and ECON 202

HIST 363  Rel in Amer Hist: 1607-1865  3 Credit Hours
A survey of the religious movements and trends in America from the 17th century to the Civil War, with emphasis on Puritanism, 18th-century revivalism, and 19th-century denominationalism and social reform. (AY).
HIST 3632 The US in the Middle East 3 Credit Hours
HIST 3632 will examine the involvement of the US in the Middle East from the late 18th Century to modern times. The relationship between domestic politics and foreign policy (both in the US and in the Middle East) will be examined as US involvement in the Middle East grows from irregular missionary and commercial activity in the 19th century, to the establishment of full diplomatic relations, to the complexities related to the globalization of the oil industry, Cold War interventions and, ultimately, the establishment of US hegemony in the region. Students will examine a number of "case studies" in US-Middle East relations as a platform for their own research into other episodes of American involvement in the Middle East. (YR)

HIST 3634 History of Islam in the US 3 Credit Hours
This course traces the long history of Islam and of Muslims in the United States (1730s-present), paying careful attention to the interaction among Muslims across the dividing lines of race, gender, immigrant generations, sect, political orientation, and class, and between Muslims and other Americans.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior or Graduate

HIST 3635 The 1960s in America 3 Credit Hours
This course aims to interweave the civil rights movement, the Vietnam War, the student movements, the women's movement, and other developments of the period to place them in an historical context of a complicated era of change. The course compels students to critically evaluate social movements, political developments, cultural trends, and foreign policies by close examination of primary documents as well as critical evaluations of the various ways that scholars have interpreted the period. (AY).

HIST 364 Rel in Am Hist II:1865-Present 3 Credit Hours
A survey of American religion from the Civil War to the present, with emphasis on ethnicity and religion and post-World War II revivals of religion. (AY).

HIST 3640 Black Intellectual History 3 Credit Hours
Full Course Title: Black Intellectual History: From Africa to the Diaspora
This course will bridge thinkers in Africa and the African Diaspora, i.e., North America, the Caribbean, and South America. It examines African and Diasporic intellectual movements from Ancient Egypt and Ethiopia to the present. Authors studied will include C.L.R. James, Frederick Douglass, Mary McLeod Bethune, Ida B. Wells-Barnett, Julius Nyerere, David Walker, Nelson Mandela, W.E.B. DuBois, Franz Fanon, Martin Luther King, Jr., and Cornel West. (YR)

HIST 3651 Women Leadership/Social Change 3 Credit Hours
The purpose of this seminar is to examine women's leadership in movements for social change. We will approach this topic through the study of historical examples, drawn primarily from the twentieth-century United States, and including movements for economic justice, race relations, sexual identity, peace, gender equality, public health, and social welfare. HIST 112 and WGST/ANTH/HUM/SOC/PSYC 303 recommended as prerequisites. (W)
Restriction(s):
Cannot enroll if Class is Freshman

HIST 3655 Automobile in American Life 3 Credit Hours
The course will explore a wide array of distinct, though interconnected, subjects such as: the manufacturing, engineering and design of the automobile and its relation to industrial and technological developments and consumer trends; the automobile's role in America's industrial growth and the impact that industrialization had upon American society; the automobile's role in urbanization and urban sprawl; the mass marketing of the automobile and its connection to broader social constructions of class, race, and gender; the environmental impact of the automobile; and the automobile's use and meaning as a cultural symbol and its relation to the American identity. Through the use of diverse mediums such as personal recollections, popular music, film, photographs, advertisements, automobile ephemera, literature, poetry and more traditional written sources the course will examine America's ongoing fascination with the automobile. (OC)

HIST 3666 Henry Ford and His Place 3 Credit Hours
Using the biography of Henry Ford as a touchstone, the course will examine the trajectories of historical change and regional development between 1870 and 1950. Of fundamental concern will be southeastern Michigan's transformation from a 19th century outpost on the Great Lakes to the nation's "engine of change" in the 20th century. Henry Ford was the major player in that revolutionary transformation. This course examines his role in history and mythology as well as the causes and implications of that transformation. (OC)

HIST 3671 Intro to Arab American Studies 3 Credit Hours
This course explores the local, national, and global conditions through which Arab American identity and its alternatives take shape. It introduces students to humanities and social science approaches to the field of Arab American Studies.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3672 Public Cultural Work 3 Credit Hours
Full Course Title: Public Cultural Work in Arab Detroit
This course offers the field of public humanities work while providing a topical focus on metro-based Arab American identity and culture. Roughly half of the course will be used to explore different approaches to public humanities work undertaken by scholars. The second half of the course will provide the historical and social context for understanding a particular research question to be examined jointly by the instructor, students, and a local cultural institution. Students will engage in intensive research and work with a cultural institution to represent their findings to the public. (OC)

HIST 3673 Arabs & Muslims in Media 3 Credit Hours
This course examines how perception of Arabs and Muslims took shape in the U.S. from the late nineteenth century through the present. Using historical developments as a conduit, we explore the treatment of Arabs and Muslims in news outlets, print media, film, and T.V. productions. For example, we analyze the motivation, plot construction, casting, and content of big budget Hollywood movies for patterns of stereotypes and representations/misrepresentations. (FAY)

HIST 3676 Arab Americans Since 1890 3 Credit Hours
This is a survey of immigration from the Arab Middle East from 1890 to the present. Readings from available scholarship, discussions, and reports facilitate exploring the Arabic-speaking immigrants’ early and recent experiences as art of U.S. society, including settlement, work, worship, military service, leisure, intellectual life, and primary and formal affiliations across the U.S.
HIST 368 Black Exp in US: 1865-Present  3 Credit Hours
The history of blacks in America is traced from the Reconstruction era and the rise of Jim Crow segregation to the Civil Rights movement of the 1960’s and the current period. Special attention is paid to the migration of blacks to the north and the social-economic situation which they encountered there. Specific topics to be addressed include formation of the NAACP. (YR).

HIST 369 Civil Rights Movement in Amer  3 Credit Hours
A survey of race relations and civil rights activity from the late 19th century to the present. The principal focus, however, is on the period since World War II, especially on the mass-based Southern civil rights movement (1955-1965) and the various policy debates and initiatives of the past thirty years, most notably affirmative action and busing. We also examine critiques of non-violence and integrationism. (AY).

HIST 3695 American City  3 Credit Hours
This course examines the development of urban America from the European-style port cities of the colonial period through the edge cities of today. The bulk of the course will focus on the late 19th and 20th century urban environment with an eye towards understanding the diverse residents, cultures, economies, and geographies that have shaped American cities. We will cover everything from developments in transportation, architecture, business, and technology to immigration, politics, and urban culture. Broad concerns and constituencies have shaped the urban public sphere, the physical development of cities and the experience of living as an urbanite and, consequently, they will receive much of our attention. American patterns of development will then be placed in context with those of other nations and cultures. (AY).

HIST 370 Women in Am-Hist Perspective  3 Credit Hours
A survey of women’s role in American society from colonial times to the present, emphasizing both change and continuity in women’s experience. (YR).

HIST 371 American Ideas, 1607-1865  3 Credit Hours
Ideas about God and humanity, nature and society, which constituted the spirit of the age from the 17th century to the Civil War. (OC).

HIST 3730 Bible in History  3 Credit Hours
In this course we will try to examine the historical circumstances and contexts surrounding the writing of The Hebrew Bible. Roughly speaking, we will begin by exploring three aspects of the subject: Historical context of the writing of the Bible-i.e. during the organizing and communicating of each segment. History of the canonization: the ideas and rationale behind including some books but not others. History in the Bible. In more specific terms, this will entail examining who wrote the Bible, when and why. The narrative incorporates the movement from an oral tradition to a written one and will demand some focus on certain pivotal moments, e.g., Ezra’s reading (cf. Ezra-Nehemiah), or the historical events in Kings and Chronicles, or the defeat of the northern kingdom of Israel in 722 B.C.E. (BC) and of the southern kingdom of Judah in 589 B.C.E.

HIST 3735 Inside-Out Reading Prison Narratives  3 Credit Hours
Full Title: Inside-Out Prison Exchange: Reading Camp and Prison Narratives
The course invites students to reflect on various prison narratives from select European countries. We will investigate how men and women of different races and ethnicities experienced oppression and how they used their bodies and developed skills to remain human in dehumanizing conditions. This provides students with an opportunity to reflect on the circumstances that led to their imprisonment, but also with a way to examine how they narrated their life stories. While doing the course will examine the concept of agency as something that frames life stories. Finally, it will allow students to reflect on various ways individuals in various circumstances struggle to remake their lives inside as well as outside of prison. Various categories, such as gender, art, resistance, body and space will help us navigate through rich primary source material, which includes memoirs, drawings, paintings, and poems created within a constrained space of prisons and camps. The course is part of the Inside-Out Prison Exchange Program, which combines a theoretical knowledge with practical understanding and experience by holding class inside Macomb Correctional Facility throughout the semester. The class has roughly equal numbers of UMD students and incarcerated students, and utilizes a variety of active learning techniques, leading to the production of one or more class projects by the end of the course.

HIST 374 History of Industrial Technlg  3 Credit Hours
Focusing on western Europe and the United States since the Industrial Revolution, this course will examine the history of manufacturing technologies and will include the following topics: mechanization and the rise of the factory; mass production; the process of innovation; design and diffusion of new technologies; technologies; technology and the changing nature of work; automation and lean production systems. Through readings, class discussions, and examination of artifacts (actual tools and machines), students will consider the central role played by technology in the making of modern society. (OC).

HIST 375 Heterodox Economics  3 Credit Hours
This course introduces students to alternative perspectives on economic theory and method. These alternatives include: Marxian and radical political economics, institutional and evolutionary economics, behavioral economics, post-Keynesian economics and feminist economics. (OC).
Prerequisite(s): ECON 201 and ECON 202

HIST 3750 Modern Warfare  3 Credit Hours
A chronological overview of the major military conflicts occurring between 1775 and 2001, with an emphasis on the technological, political, international and social changes that shaped the course of modern warfare. Designed to explore the connections between “total war,” the rise of mass society and the relationship between modern warfare, revolution and decolonization.

HIST 377 History of Consciousness  3 Credit Hours
Traces changes in the way people have viewed themselves, the world and changes in the forms or orders of thinking; in other words, changes in consciousness and concepts of the unconscious. The mode is intellectual history and involves studies of the ideas of philosophers, psychologists and literary artists. The class will examine ancient and “primitive” consciousness as well as forms of society. (AY).

HIST 379 Language, Myth & Dreams  3 Credit Hours
An examination of the relationships between language, myth, dreams, and thinking processes; considers the work of such scholars as Ernst Cassirer, Noam Chomsky, and Freud; studies the nature of the mind from philosophical, psychological and literary perspectives. (AY).
HIST 381  Intell Hist of Modern Europe  3 Credit Hours
An examination of the intellectual currents from the scientific revolution, the Enlightenment, the currents of 19th and 20th century thought including romanticism, conservatism, liberalism, socialism, Darwinism. Includes analysis of the reactions to World War I, the Russian Revolution, and World War II. Readings include works by Descartes, Rousseau, Marx, Darwin, Zola, Freud, Kafka and Koestler. (AY).

HIST 383  Labor in America  3 Credit Hours
A survey of urban workers from colonial times to the present. Among the topics covered are changing standards of living, the experiences of industrial work, labor organization, and working-class politics. (YR).

HIST 384  Immigration in America  3 Credit Hours
A survey of the "immigrant experience" in the United States, from the early 19th century to the present. Particular attention is given to enduring problems of economic adjustment and cultural assimilation, and to the impact of immigration on the host society. (AY).

HIST 385  Modern France  3 Credit Hours
A history of France from the French Revolution to the present. The major emphasis is on the political evolution of France with some attention to social and economic development. (AY).

HIST 386  Compar History of Technology  3 Credit Hours
This course will examine the history of technology from a comparative perspective: studying the development and impact of technology in different societies during various historical eras. Topics include: irrigation control and the rise of ancient empires; technology's role in the industrial revolution; technological innovation and the pace of social change. Current issues and various analytical perspectives in the history of technology will also be examined. (OC).

HIST 387  Aspects of the Holocaust  3 Credit Hours
A survey of how and why millions of Jews, Gypsies, Slavs, and political and "racial" enemies of the Reich were so quickly and determinedly slaughtered. (YR).

HIST 389  Nazi Germany  3 Credit Hours
History of National Socialism, its goals and structure. Also addressed are the nature of the dictatorship; the role of the historian in interpreting the era and the use and evaluation of historical documents. (YR).

HIST 390  Topics in History  3 Credit Hours
Problems and issues in selected areas of history. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when specific topics differ. (OC).

HIST 390D  Topics in History  3 Credit Hours
TOPIC TITLE: State, Culture and Society in Modern Iran. For Iranian specialist, these are exciting times. There is a new wave of interdisciplinary research on Iran coinciding with a surge of political and intellectual debate about the direction of contemporary Iranian society. Honors students will capitalize on this in the tutorial by examining Iranian history and society from a number of interrelated standpoints: historical, legal, literary, anthropological and cinematic. We will cover the following topics: the rise of the modern state in Iran (from sacral kingship to the Islamic Republic), Twelver Shi a Islam in Iran (including the rise of modern clergy and heretical off-shoots), Islamic revivalism in Iran (Ali-Afghani, Khomeini and the Islamic- Marxist, Ali Shari ati and reformist Abd al-Karim Sorush), modern Persian prose (Jamalzadeh, Daneshvar, Chubak and Al-e Ahmad), America and Iran and economy and society in Iran (oil industry, urbanization and mass media culture). These topics will be explored through a combination of research monographs, translated literary or historical material (e.g., both of Iran's constitutions) and films. Students will read, discuss and write on the following text: The Mantle of the Prophet by Roy Mottahedeh and The Daughters of Quchan by Afsaneh Najmabadi (history), The Children of Deh Koh by Erik Friedl and Law of Desire by Shahla Haeri (anthropology), Persian is Sugar by Mohammad Ali Jamalzadeh, Savushun by Simin Daneshvar, The Patient Stone by Sadeq Chuba (fiction), and Weststruckness by Jalal Al-e Ahmad (social criticism).

HIST 390E  Topics in History  3 Credit Hours
TOPIC TITLE: Reconstructing Historical Memory: The Second World War and the America Cinema.
Prerequisite(s): HIST 365 and HIST 261 and HIST 262 and HIST 263
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

HIST 390H  Topics in History  3 Credit Hours
Topic: The Native American Past. This course introduces students to the long and rich history of America's First Peoples from earliest times to the present. Although the topics covered in class will be wide-ranging, the course emphasizes certain unifying themes: the diversity of indigenous peoples and cultures; the agency of First Peoples; the political, economic, and cultural dimensions of European/Indian accommodation and resistance; the evolution of government Indian polices and Native American responses to them; and contemporary issues confronting native peoples. The course examines the Native American Past from native people's perspectives, including the unfamiliar voices of those peoples in more familiar accounts of America's past, and by introducing students to ways of studying neglected parts of the past and to some of the varied ways that historians (both Native and non-Native) have interpreted the Native American past.

HIST 391  Topics in History  3 Credit Hours
Examination of problems and issues in selected areas of history. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

HIST 398  Independent Studies in History  1 to 3 Credit Hours
Readings or analytical assignments in history in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. (OC).

HIST 399  Independent Studies in History  1 to 3 Credit Hours
Readings or analytical assignments in history in accordance with the needs and interests of those enrolled as agreed upon by the student and instructor. (FW).
HIST 4312  European Encounters, 1400-1800  3 Credit Hours
During the early modern period, merchants, explorers and travelers set out from the European West in unprecedented voyages of discovery, intensifying interaction between cultures and initiating contact with previously unknown civilizations. In this advances seminar we examine original documents (in English) as well as current scholarship about encounters between groups of Europeans and inhabitants of other parts of the world from the perspective of both sides. Comparing these contradictory (and often incompatible) accounts of the same events, provides a more comprehensive understanding of the process of European expansion, and of the strengths (and limitations) of historical sources. Additional assignments will distinguish the undergraduate and graduate versions of this course.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Arts, Sciences, and Letters

HIST 4401  Seminar: African Diaspora  3 Credit Hours
Research seminar on the history of the African Diaspora in the Atlantic World. This course covers examples of classic texts in the field, as well as significant new scholarship, with an emphasis on critical reading, analysis, and the development of an independent research project. Students gain a deeper understanding of the significance of the African Diaspora in the New World, derived from lectures and discussions providing an overview of this subject, as well as the micro views gleaned from sharing classroom presentation about students' individual research topics. The graduate version of this course includes weightier readings and assignments, with a research paper for potential publication.
Prerequisite(s): HIST 300 or AAAS 275 or HIST 345 or AAAS 345
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Graduate

HIST 4505  Feminism & Mod. Mid. East  3 Credit Hours
This course provides an analysis of the history, historiography, and sources for the study of feminism in the Middle East since 1800.
Prerequisite(s): COMP 106 or HIST 101 or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 4512  European Encounters, 1400-1800  3 Credit Hours
During the early modern period, merchants, explorers and travelers set out from the European West in unprecedented voyages of discovery, intensifying interaction between cultures and initiating contact with previously unknown civilizations. In this advances seminar we examine original documents (in English) as well as current scholarship about encounters between groups of Europeans and inhabitants of other parts of the world from the perspective of both sides. Comparing these contradictory (and often incompatible) accounts of the same events, provides a more comprehensive understanding of the process of European expansion, and of the strengths (and limitations) of historical sources. Additional assignments will distinguish the undergraduate and graduate versions of this course.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Arts, Sciences, and Letters

HIST 4600  U.S. Cultural History  3 Credit Hours
The seminar concentrates on scholarly interpretations of U.S. history through a cultural lens. It features close analysis of classic texts in American cultural history as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the cultural aspect of U.S. history and a familiarity with this mode of analysis, its guiding theories, newest trajectories and scholarly debates, and impact on the field of history as a whole. Additional assignments will distinguish the undergraduate and graduate versions of this course. Cannot receive credit for both HIST 490A and HIST 4600.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 465  The Family in History  3 Credit Hours
An analysis of the emergence of the modern family from the 16th century to the present with focus on the history of childbirth, family size and structure, intra-familial and inter-generational relationships and population patterns. (OC).

HIST 4650  Sem in US Women's History  3 Credit Hours
Seminar on the historiography and key primary sources related to U.S. Women's History. The course covers examples of classic texts in the field as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the field, its guiding concepts, foundational texts, newest trajectories, and impact on the field of history as a whole.
The graduate version of this course includes weightier readings and assignments.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 4677  Arab American Identities  3 Credit Hours
Extensive discussions and critical analysis of the main markers of Arab American identity formation from late nineteenth century to present. This seminar provides in-depth assessments of immigrant narratives from various sources and disciplinary approaches on specific racial, ethnic, and gender experiences within the larger U.S. context. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 4688  Middle Eastern Diasporas  3 Credit Hours
This course explores the diasporas of Arabs, Turks, Assyrians, and Iranians living in Europe and the Americas that have occurred since the 1880s. It pays careful attention to how "aspects of diaspora" shape, mimic, transact, and undermine the political and economic regimes of which they are part. The reception of Middle Eastern communities in different national contexts and historical periods receive special attention as do their adaptive strategies as religious, ethnic, gendered, and racialized minorities. Those enrolled in the graduate level of the course pursue additional readings and assignments.
Prerequisite(s): AAST 3150 or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
HIST 4690  Borderlands History  3 Credit Hours
In this advanced reading seminar, students explore major themes and historiographical approaches to the study of borderlands history. Borderlands history is a growing historical field that focuses on interactions of peoples and empires across present day national boundaries. Borderlands history is a historical approach that originated among historians of the United States, so a majority of our readings focus on North America. Many of the insights of the U.S. borderlands history, however, have influenced historians of borderlands regions worldwide, and so we also read borderlands histories focusing on other regions of the world, particularly China and Central Eurasia.
Prerequisite(s): HIST 300

HIST 490  Sel Topics Seminar in History  3 Credit Hours
Examination of problems and issues in selected areas of history. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when specific topics differ. Primarily, but not exclusively, for undergraduate history concentrators. Students are introduced to current issues in the area of historical research and learn how to appreciate selected writings, which represent the best of recent scholarship. (OC).
Prerequisite(s): HIST 300

HIST 497H History Seminar  3 Credit Hours
This course is unlike other courses offered by the history discipline in that its primary function is to introduce students to the process of intensive historical inquiry with its end being the production of a high-quality, original research paper. As a seminar, it is intended for advanced concentrators who will research their own specialized topics within the intellectual community of the seminar?providing support and enrichment for the other class members. The general theme for the semester is ? Microhistory.? Within this general rubric we will be focusing upon three major issues: 1) Microhistory as a tool of historical investigation/analysis [i.e., what is microhistory?], 2) the advantages/disadvantages of this approach to historical inquiry [what can it reveal for us?], and 3) employing the technique to produce a discrete microhistorical study [how do we do it?]. The overall purpose of this micro-level approach is to provide a distinct, readily accessible medium through which to consider broader historical trends.

HIST 498  Senior Honors Thesis  3 Credit Hours
Two successive semesters of independent work on a major research paper under the direction of a member of the discipline and the program coordinator. (F,W).
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if Major is History

HIST 499  Advanced Ind Studies in Hist  1 to 4 Credit Hours
Readings and analytical writing in history, in accordance with the interests of the student and approval of the instructor. Students must submit a written proposal of study for approval. (OC).
Restriction(s):
Can enroll if Level is Undergraduate

HIST 4999  Senior Research Seminar  3 Credit Hours
This seminar is required for the completion of an undergraduate degree in history. Students will develop an independent research paper that is well-grounded in the appropriate academic literature and using advanced research methodology. History concentrators may not use credit for both this course and HIST 497 or HIST 498 to meet their capstone requirement.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is History

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

History of Music (MHIS)

MHIS 100  Intro to Music  3 Credit Hours
A study of Western classical music and its historical development up to the present, through examination of representative musical works.

MHIS 120  History of Jazz  3 Credit Hours
The course provides an introduction to jazz styles within their cultural context. Major figures (Louis Armstrong, Duke Ellington, Charlie Parker, and others) and styles (New Orleans, Big Band, Bebop, Cool Jazz, etc.) will be studied through recordings. Ideas about jazz as the expression of African American culture will be studied. (OC).

MHIS 130  Intro to World Music  3 Credit Hours
This course is designed as an introductory survey of non-western music traditions within the field called ethnomusicology. The music is studied in terms of sounds, musical instruments, forms and their functions in the society and culture that supports them. Music studied includes that of the Middle East, India, Australia, China, Korea and Japan. (YR).

MHIS 311  Music Before Bach  3 Credit Hours
A survey of the early history of music with emphasis on sacred and secular monophonic forms, the rise of part-singing and the opposition to it in the 17th century. (AY).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 312 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 312  Music from Bach to Brahms  3 Credit Hours
A survey of music in the 18th and 19th centuries with emphasis on the styles and forms of the major composers. (AY).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 313 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390
MHIS 313  Music Since 1900  3 Credit Hours
A survey of developments in musical styles (especially concert and popular music) and uses of music (film, theater, and recording technologies) in the 20th and 21st centuries.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390 or MTHY 101

MHIS 331  Music of America  3 Credit Hours
An historical and cultural study of American music in both the written and unwritten traditions. Content of the course includes not only the various forms of classical music produced in the new world but also primitive, popular, and vernacular genres. (OC).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390 or MAPP 125 or MAPP 126 or MAPP 135 or MAPP 136 or MAPP 145

MHIS 332  Hist of Popular Mus in the USA  3 Credit Hours
An introduction to popular music in the United States. This course will include music of the westward movement, ragtime and blues, the roots and growth of jazz, folk music, country music, music of Broadway and Tin Pan Alley, the roots of and development of rock music, as well as the historical, political and sociological background of the United States as pertinent to music history. (YR).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or MTHY 101 or MTHY 102

MHIS 333  Intro to Gospel Music  3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recordings, videos, film, and at least one field experience. Underlying the course is the theory (Mellonee Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).

MHIS 335  Multimedia and Music  3 Credit Hours
In this course, students will explore case studies of music created, performed, and distributed in combination with other media from the 1960s to the present. Multimedia is understood as any context in which several media are integrated, but particular focus will be paid to technological and creative innovations (such as video games, computers, and phones). The use of music will be considered in such media as film and television, multimedia performance and installation art, and international developments in multimedia production and distribution.
Prerequisite(s): MTHY 100 or MTHY 101 or MTHY 102 or MHIS 100 or MHIS 120 or MHIS 130 or MHIS 150

MHIS 336  Film and Music  3 Credit Hours
In this course, students will be introduced to the varieties of music used in film from c. 1900 to the present. Topics covered include a basic introduction to the musical features of Western European dramatic music; the role of music in the early decades of the 20th century; the growth of film and musical sound in the "classic era" of Hollywood film; the use of music in specific genres such as film noir, science-fiction, epic, and musicals; and the use of popular song in film. Prerequisite: previous completion of MHIS 100, 120, 130, or by permission of the instructor.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130

MHIS 337  Women Musicians/West Mus Hist  3 Credit Hours
Through a historical survey of female musicians from the Middle Ages to the present day, this course takes a critical look at theories of creativity and professionalism as they relate to female musical production. The course deals with women in European "art music" traditions and also in jazz and popular music. Social and cultural norms dictating appropriate female involvement with music are examined. The historical approach will serve to reveal ways in which terms such as professionalism and virtuosity have continually shifted and changed in reference to female musical performance. The course challenges students to re-think many of the commonly accepted gender-based descriptions of particular genres and elements of music through listening and musical analysis.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or WGST 275 or PSYC 275 or HUM 275 or SOC 275 or ANTH 275 or WGST 303 or ANTH 303 or SOC 303 or PSYC 303 or HUM 303 or WST 275
Restriction(s): Cannot enroll if Class is Freshman

MHIS 341  Symphony and Symphonic Poem  3 Credit Hours
The symphony and symphonic poem developed from their origins to their more complex later forms. Comparative analysis of similar forms in different periods. (OC).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 313 or MHIS 340 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 343  Opera  3 Credit Hours
A study of selected examples of music theater from the late 16th century to the present, including a comparison of the qualities of sung versus spoken drama, with emphasis on the achievements of such composers as Monteverdi, Mozart, Wagner, and Verdi. (AY).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 313 or MHIS 340 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 344  W. African Music: Trad.& Glob.  3 Credit Hours
West African popular music contains a unique mixture of African, Cuban, European and American influences. With the advent of radio and recording, music that was once locally based is now part of a national and international popular music industry. This course offers an overview of modern West African music, both traditional and popular. The course begins with an introduction to traditional West African instruments and musical genres. Next, there is an exploration of the fusion of traditional African styles with European, Cuban and American styles during and after the colonial era. The course culminates with an examination of the contributions of West African musicians to the World Music scene, focusing on issues of representation and Fair Trade.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 313 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 388  W. African Music: Trad.& Glob.  3 Credit Hours
West African popular music contains a unique mixture of African, Cuban, European and American influences. With the advent of radio and recording, music that was once locally based is now part of a national and international popular music industry. This course offers an overview of modern West African music, both traditional and popular. The course begins with an introduction to traditional West African instruments and musical genres. Next, there is an exploration of the fusion of traditional African styles with European, Cuban and American styles during and after the colonial era. The course culminates with an examination of the contributions of West African musicians to the World Music scene, focusing on issues of representation and Fair Trade.

MHIS 390  Topics in Music History  3 Credit Hours
Examination of problems and issues in selected areas of music history. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specified topics differ. (OC).

MHIS 399  Independent Study  1 to 3 Credit Hours
Advanced readings or analytical assignments in a particular area of music. Not more than three hours of independent study will be accepted toward the concentration. (FW).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally.

**Honors (HONS)**

**HONS 300  Four Trials  3 Credit Hours**
To teach habits of informed criticism based on critical analysis of primary and secondary texts. This course will give Honors students the opportunity to learn reflective, critical listening and inquiry skills, which are essential to informed discussion of the Honors core course material. The content of specific courses will vary from semester to semester according to individual instructors.

**Restriction(s):**
Can enroll if Attribute is Honors Program

**HONS 301  Western Culture I  3 Credit Hours**
Full Course Title: Western Culture I: Classical and Biblical Traditions First of series of four courses. An interdisciplinary course on the nature of the Western classical and Biblical traditions. It examines Western values, attitudes, history, art history, the roots of scientific thought, logic and social institutions such as the family and the state. Included are works of literature, history, philosophy, and art history.

**Restriction(s):**
Can enroll if Attribute is Honors Program

**HONS 302  Western Culture II  3 Credit Hours**
Full Course Title: Western Culture II: Middle Ages, Renaissance, Reformation Second of four courses on Western Civilization required of all Honors Students. The course covers the period of the Middle Ages, Renaissance, and Reformation. Focus is on the ways in which Biblical and Classical traditions are preserved, adapted, transformed, or discarded under the pressures of new social and political formations. Materials are drawn from literature, philosophy, political theory, art.

**Restriction(s):**
Can enroll if Attribute is Honors Program

**HONS 303  Western Culture III  3 Credit Hours**
Full Course Title: Western Culture III: Age of Enlightenment This course covers the period from the 17th to 19th centuries. Focus is on the emergence of scientific thought, enlightenment political theory, romantic individualism, and the great 19th-century intellectual revolutions of Darwinism, Marxism, and feminism. Materials are drawn from literature, philosophy, and political and scientific writings. Third of four courses on Western Civilization required of all Honors Students.

**Restriction(s):**
Can enroll if Attribute is Honors Program

**HONS 304  Western Culture IV  3 Credit Hours**
Full Course Title: Western Culture IV: Modern Era Fourth of four courses required of all Honor Students. This course covers the period from late 19th century to the present. Focus is on selected major issues of Western civilization in the modern era: science and human values, bureaucratic and totalitarian societies, psychoanalytical thought, feminism, nihilism, and existentialism.

**Restriction(s):**
Can enroll if Attribute is Honors Program

**HONS 390  Honors Topic Course  3 Credit Hours**
Full Course Title: Honors Topic Course Shell (F;W;S;OC)

**Restriction(s):**
Can enroll if Attribute is Honors Program

**HONS 390C  Honors Topics Course  3 Credit Hours**
Topic Title: Democracy, Division, and Hate: Democracy has been understood as a setting where equal citizens collectively make decisions about law and public policy in an environment of equality, fairness, and mutual respect. Political theorists from JS Mill to Rawls have attempted to define the conditions that make a democratic civil society possible. Today the world’s democracies are challenged by powerful political movements based on intolerance and division. How should democratic theory respond to the challenge of hate-based political movements? The course reexamines classic ideas in democratic theory, current sociological research.

**Prerequisite(s):**
HIST 365 or HONS 300

**Restriction(s):**
Can enroll if Attribute is Honors Program

**Human Resource Management (HRM)**

**HRM 305  Human Resource Policy/Admin  3 Credit Hours**
To examine personnel policy making and administration relative to the achievement of the objectives of the firm through the eyes of general management. Topics include: recruitment and selection, wage and salary administration training, evaluation, discipline and industrial relation activities. Cases are analyzed.

**Restriction(s):**
Cannot enroll if Class is Freshman or Sophomore

**HRM 405 or HRM 305**

**HRM 406  Talent Sourcing & Acquisition  3 Credit Hours**
The course examines how to design, administer, and evaluate talent sourcing and selection activities that support organizational strategies. The course is geared both toward those who are or will be (a) current HR managers who develop and administer staffing programs and (b) managers in other functional areas who want to improve their personal effectiveness in recruiting and selecting employees. Key topics to be covered include: staffing strategy and planning; job design and analysis; external and internal recruiting; employee testing and assessment methods; interviewing; measurement, validation, and decision-making issues in selection; laws and regulations affecting staffing and evaluation methods for staffing.

**Prerequisite(s):**
HRM 405 or HRM 305

**HRM 407  Compensation & Performance Mgt  3 Credit Hours**
The course examines how to design, administer and evaluate compensation and performance appraisal programs that support organizational strategies. The course is geared both toward those who are or will be (a) HR managers who will develop and administer pay and appraisal programs and (b) managers in other functional areas who want to improve their personal effectiveness in administering pay performance appraisals. Key topics to be covered include: merit and incentive pay, methods for internally valuing jobs, external labor markets and job pricing, design and administration of pay structures, employee benefits, compensating executives and expatriates, purposes and measurement methods for performance appraisals, performance criteria, rater processes and biases, performance reviews, and team-based pay and performance. (YR).

**Prerequisite(s):**
(HRM 405 or HRM 305) and OB 354

**HRM 408  Legal Issues in Human Resource  3 Credit Hours**
The course examines employment law pertaining to human resource management including such areas as selection, compensation, performance appraisal, training, labor relations, and occupational safety and health.

**Prerequisite(s):**
HRM 405 or HRM 305
HRM 409  Talent & Leadership Develop  3 Credit Hours
Training and leadership development are key elements of the human resource function. This course will teach students how to design and evaluate formal training programs and employee development programs, and how to conduct performance improvement interventions. Topics include needs assessment, adult learning and learning transfer theories, program design, and evaluation. (YR)  
Prerequisite(s):  HRM 305

HRM 485  Seminar:Human Resource Mgmt  1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.  
Restriction(s):
Can enroll if Class is Senior  
Can enroll if College is Business

HRM 495  Research:Human Rsrch Mgmt  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit.  
Restriction(s):
Can enroll if Class is Senior  
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:  
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Humanities (HUM)

HUM 100  Introduction to Humanities  3 Credit Hours
An introduction to the visual arts, music, and drama in western and world societies. Through study of individual works, the course teaches appreciation of the arts in their aesthetic and technical qualities, and understanding of the arts as expressions of diverse societies, varied historical conditions, and shared human experiences. (YR).

HUM 170  Studies in Humanities  3 Credit Hours
An interdisciplinary examination of selected key ideas in contemporary western thought. Emphasis will be placed upon how the issues and problems in question manifest themselves in popular and high culture. (YR).

HUM 171  Styles in 19th Century  3 Credit Hours
An introduction to the two principal styles of the 19th century, romanticism and realism, viewed within the general evolution of European civilization. After reading works of the classical tradition, the class will study masterpieces that illustrate the romantic and realist movements. (OC).

HUM 200  The Human Condition  3 Credit Hours
The human condition as seen in selected works of philosophy and literature. Typical issues: the meaning of life, the existence of God, moral responsibility for human actions, and the role of society in promoting or hindering human excellence. (YR).

HUM 201  Religions of the World  3 Credit Hours
A study of religion in essence, in manifestation, and in relationship with the other dimensions of culture; a treatment of man's religious interests and the various ways in which he has sought to pursue these interests. Surveys major world religions. (OC).

HUM 221  Great Books I: Ancient World  3 Credit Hours
Introduction to masterpieces of Western world literature from the ancient world. Readings include the Bible, Iliad, Odyssey, Greek drama, and Roman authors. (YR).

HUM 222  Gr Bks II: Midd Ages and Ren  3 Credit Hours
Introduction to masterpieces of Western world literature from the Middle Ages and Renaissance. Readings include Dante, Chaucer, Wolfram, Cervantes, Shakespeare, Moliere, and Racine. (YR).

HUM 223  Gr Bks III: Modern Era  3 Credit Hours
Introduction to masterpieces of Western world literature from the Modern Era. Readings include Swift, Voltaire, Rousseau, English romantic poets, fiction and drama of the 19th and 20th century. (YR).

HUM 240  Film and Society  3 Credit Hours
A survey of the major genres of film, chiefly in historical and political perspective, but also in light of important intellectual frameworks (e.g., feminism, psychoanalytical theory). The films selected, both Western and non-Western, will be examined both for their visual codes of meaning and for their wider role in developing a powerful social language in various cultural contexts. (OC).

HUM 248  Introduction to Screen Studies  3 Credit Hours
This course will introduce students to the development of world cinema by integrating the aesthetics of film with its technology, and its social and economic milieu. It will train the students in analyzing the formalist qualities of the medium, and in understanding the evolution of its various genres and styles. (YR).

HUM 263  Honors: Western Cult III  3 Credit Hours
Third of four courses on Western Culture required of all Honors students. Course covers period from 17th to 19th centuries. Focus is on the emergence of scientific thought, Enlightenment political theory, Romantic individualism, and the great 19th-century intellectual revolutions of Darwinism, Marxism, and feminism. Material will be drawn from literature, philosophy, and political and scientific writings of the period. (YR).  
Prerequisite(s):  HIST 365

HUM 270  Intro to Africana Studies  3 Credit Hours
This gateway course in the AAAS Minor will engage the students in the intellectual issues, historical perspectives and cultural debates in African and African American Studies. Using a trans-disciplinary approach the AAAS faculty teaching this course as a team will draw from the disciplinary strengths of the Humanities, the Social Sciences and the Behavioral Sciences. Texts will include literature, film, music, art, theater, and other forms of popular and folk culture. The course will routinely invite speakers and performers to the class and engage the campus community in these events. (YR)

HUM 290  Topics in Humanities  1 to 3 Credit Hours
Examination of problems and issues in selected areas of the humanities. Title as listed in Schedule of Classes will change according to content. Course may be repeated when specific topics differ. (OC).
HUM 300 Intro to AAAS 3 Credit Hours
This gateway course in the African and African American Studies Program introduces students to the intellectual debates, historical perspectives and cultural issues central to the field of African and African American Studies. The course readings draw from the disciplinary strengths of the Humanities as well as the Social and Behavioral Sciences. Course materials include selections from literature, film, music, art, drama, folk and popular culture. The course content is supplemented by attendance at off-campus events and visits to institutions featuring significant aspects of African and African American history and culture.
Restriction(s):
Cannot enroll if Class is Freshman

HUM 303 Intro to Women's & Gender Stud 3 Credit Hours
This course provides an interdisciplinary overview of the key theories and topics in Women's and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women's and men's lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.
Restriction(s):
Cannot enroll if Class is Freshman

HUM 304 Studies in Det.Hist. & Culture 3 Credit Hours
This interdisciplinary course explores the political, social, and cultural history of Detroit by examining ways various groups and classes have interacted with and been shaped by structures of power and influence. The course highlights trade and commerce, newcomers, and the influence of organizations and institutions within the contexts of labor, race, ethnic, and religious histories and current affairs, and examines how these fit into the evolution of Detroit from the 19th century to the present. Where pertinent the influence of national and international movements included.

HUM 305 The Arts & Culture of Detroit 3 Credit Hours
This interdisciplinary course explores the modern and contemporary cultural history of Detroit, examining the ways in which various population groups have been creative from the nineteenth century to the present. The course highlights the work of architects, designers, photographers, visual artists, poets, and musicians, and situates them in the broader cultural context of American art and history.

HUM 311 Art of China 3 Credit Hours
An introduction to the civilization of traditional China through the historical presentation of its art forms, literary achievements, and philosophical structures. The course will survey the Buddhist, Daoist, and Confucian content of Chinese art and culture from the Shang to the Qing dynasties.

HUM 312 Art of Japan 3 Credit Hours
An introduction to representative works of art produced in Japan from the Neolithic era down to modern times. The artifacts cultural context will be examined including religious practice (Shinto and Buddhism), influence from abroad, and other artistic developments in literature, music, and theatre.

HUM 313 Chinese Painting 3 Credit Hours
A historical survey of the painting of China from the earliest examples found in tombs through works influenced by the West from the modern period. Students will be introduced to Eastern philosophy and relevant literary genres which provide a context for the development of the Chinese painting tradition.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

HUM 315 Early Chinese Art and Archaeol 3 Credit Hours
An examination of the art and architecture of early China (Neolithic through Eastern Han). Recent excavations that have significantly changed our view of the early period will be given emphasis. Students will analyze relevant literary and philosophical texts in translation to enhance understanding of the cultural context.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

HUM 321 Popular Culture 3 Credit Hours
This course examines the art forms of contemporary popular culture, including rock 'n' roll, movies, television, advertising design, and commercial architecture. Our critical inquiry emphasizes the development of the aesthetics and the myths of our modern mass media environment, as well as relationships between popular and "high" culture. (AY).

HUM 3335 Intro to Gospel Music 3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recording, videos, film and at least one field experience. Underlying the course is the theory (Mellonee Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).

HUM 335 Women in Medieval Art 3 Credit Hours
Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women's roles in the creation and patronage of art and literature, economic and family issues, and women's participation in new and innovative forms of religious piety.

HUM 337 Women Musicians/West Mus Hist 3 Credit Hours
Through a historical survey of female musicians from the Middle Ages to the present day, this course takes a critical look at theories of creativity and professionalism as they relate to female musical production. The course deals with women in European "art music" traditions and also in jazz and poplar music. Social and cultural norms dictating appropriate female involvement with music are examined. The historical approach will serve to reveal ways in which terms such as professionalism and virtuosity have continually shifted and changed in reference to female musical performance. The course challenges students to re-think many of the commonly accepted gender-based descriptions of particular genres and elements of music through listening and musical analysis.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or WGST 275 or PSYC 275 or HUM 275 or SOC 275 or ANTH 275 or WGST 303 or ANTH 303 or SOC 303 or PSYC 303 or HUM 303 or WST 275
Restriction(s):
Cannot enroll if Class is Freshman

HUM 338 Women in the 20th Century 3 Credit Hours
An interdisciplinary examination of the roles of women in the 20th Century, focusing on their roles in the social, cultural, and economic spheres. Course materials include the works of feminist writers and activists, and the theoretical frameworks of critical and cultural studies.

HUM 339 Women's History 3 Credit Hours
This course is designed to introduce students to the major events and developments in the history of women in the United States from colonial times to the present. It is an examination of women's lives in historical context, and serves as an introduction to women's history as a distinct field of study.

HUM 339W Women's History Workshop 1 Credit Hour
This course is designed to provide a hands-on experience in conducting research and writing about women's history. Students will work with primary and secondary sources to create a research paper and presentation on a topic of their choosing.

HUM 343 Opera 3 Credit Hours
An introduction to the study of the musical genre of opera through consideration of major operas based upon literary and dramatic works. Covers examples of operas of all eras, from the time of Monteverdi to present. (OC).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390
HUM 3435  Adaptations of Literary Texts  3 Credit Hours
This course explores the adaptation of literary texts in a variety of literary genres (poetry, drama, fiction) to other artistic mediums (film, graphic novels/comics, paintings, etc.). Moving beyond limited comparisons of "good" originals and "bad" adaptations, this course focuses on the dialogue among multiple versions of the same story across a range of historical periods, asking how and why adaptations modify their sources in a particular manner. This course addresses the difference between adaptation and appropriation as well as imitation, quotation, allusion, pastiche, and parody.
Prerequisite(s): (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239) and (COMP 106 or COMP 220 or COMP 270 or COMP 280)
Restriction(s):
Cannot enroll if Class is Freshman

HUM 346  Bible and Western Tradition  3 Credit Hours
An examination of Biblical literature in various English translations, with emphasis on genres and the use of Biblical materials in European and American literature, art, and music. (OC).

HUM 348  Warriors, Lovers, and Saints  3 Credit Hours
An in-depth examination of various personalities of the Middle Ages, both historical and fictional, who are distinctive for their martial prowess, their reputation as lovers, their piety, or some combination of these traits. Attention to these figures (e.g., Roland, Tristan, St. Augustine, and Abelard) will enable the class to consider important medieval norms of behavior, such as chivalry, courtly love, and Christian faith.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

HUM 349  Bible In/As Literature  3 Credit Hours
This course will study selected readings from the Bible, first in regard to their own literary, historical, and cultural contexts, and then in regard to their reception, interpretation, and reapplication by later literary tradition. Biblical selections may cover both the Old and New Testaments as well as Apocryphal traditions, while readings from later non-biblical texts will be drawn from various literary periods.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

HUM 355  Urban Voices: France and Italy  3 Credit Hours
This course is an interdisciplinary approach to the concepts of urban development and literary, visual and cultural responses to the process of urbanization mainly in Rome and Paris. The readings will illustrate how the city shaped the writers' creativity, as well as how their works interpret urbanization.
Restriction(s):
Can enroll if Class is Freshman

HUM 356  Reading Urban Monstrosity  3 Credit Hours
This course questions the literary techniques and forms the English writers developed between 1660 and 1900 to characterize and imagine London to be a unified community and to counter the growing perception of London as a "monstrous city." This image of "the English-speaking City" as an uncontrollable monster may be explored in writings by Daniel Defoe, Jane Austen, Elizabeth Gaskell, Robert Louis Stevenson, Charles Dickens, Thomas Hardy, and Joseph Conrad.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

HUM 357  National Cinemas  3 Credit Hours
This course will introduce students to the national cinema of a select country. In contrasting the evolution of global cinema with the dominant genres and conventions of Hollywood, the course will enable students to critically examine non-Hollywood narratives; the interaction of various nationalist movements within the institution of cinema; and the ways in which world cinema has been infected by various indigenous performance practices and other visual representations. (OC).
Prerequisite(s): FILM 240 or HUM 240 or FILM 248 or HUM 248 or ENGL 248

HUM 358  Shakespeare on Film  3 Credit Hours
The course examines the adaptation of Shakespeare's play-scripts for the screen. It goes beyond a discussion of the relative merits of plays and their respective film adaptations, examining the complex exchanges between the two artistic mediums (e.g., how stage convention such as soliloquies or off-stage action are adapted to the screen; how early silent films were used to market stage productions, etc.) It will approach the issue of adaptation by examining the works of key directors, multiple films of a single play, silent films, foreign language adaptations, mass market and art house films, and films which deal with fictive or actual productions of Shakespeare's plays. Special emphasis will be placed on specific stage productions that are later adapted into films. In this course, students will explore a broad range of responses to and interpretations of Shakespeare's works. The class will stress the idea that each staging is an interpretation of the play, its point of view conditioned by the times, the medium, and the director's vision.

HUM 366  Sexualities, Genders, & Bodies  3 Credit Hours
This course introduces key questions and debates in lesbian, gay, bisexual, transgender, and queer studies. Through engagement with multidisciplinary sources, students explore how sexualities, genders, and bodies are constructed and contested, how these constructions vary in diverse contexts and historical moments, and what gaps remain in our knowledge of LGBTQ lives. (YR)

HUM 371  Philosophy in Literature  3 Credit Hours
An exploration of philosophical problems as they are encountered in works of literature. Students electing this course must have successfully completed a previous course in philosophy or have permission of the instructor. (OC).
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 411 or PHIL 442 or PHIL 485 or PHIL 490
HUM 385  Black Cinema  3 Credit Hours
The course will examine selected films from African American and African film traditions in order to analyze how their cultural production is responsive to the conditions of social oppression, economic underdevelopment, and neo-colonialism. How film traditions define “Black aesthetics” will also be discussed. (AY).
Prerequisite(s): ENGL 240 or HUM 240 or ENGL 248 or HUM 248 or FILM 240 or FILM 248

HUM 388  W. African Music: Trad.&Glob.  3 Credit Hours
West African popular music contains a unique mixture of African, Cuban, European and American influences. With the advent of radio and recording, music that was once locally based is now part of a national and international popular music industry. This course offers an overview of modern West African music, both traditional and popular. The course begins with an introduction to traditional West African instruments and musical genres. Next, there is an exploration of the fusion of traditional African styles with European, Cuban and American styles during and after the colonial era. The course culminates with an examination of the contributions of West African musicians to the World Music scene, focusing on issues of representation and Fair Trade.
Prerequisite(s): MHS 100 or MHS 120 or MHS 130 or MTHY 100 or AAAS 106 or AAAS 275 or HUM 100 or HUM 270

HUM 389  Nazi Germany  3 Credit Hours
The course traces the development of the Nazi movement from its ideological roots to Hitler’s dictatorship, 1933-1945. Political events are interpreted in their social and cultural context to provide a comprehensive view of National Socialism. (OC).

HUM 390  Topics in Humanities  1 to 3 Credit Hours
Three Writers, Three Worlds: The Poetry of Eliot, Cesaire and Neruda. This course offers upper division students an intensive study of the works and lives of three poets who are considered among the greatest in their respective cultures and in the world: Pablo Neruda, Aime Cesaire, and T. S. Eliot. This will be an exploration of the artistic and aesthetic sensibilities of these poets, their development as intellectuals, the experiences that shaped their worldviews, and their engagement with significant historic movements or moments of the 20th Century.

HUM 395  Japanese Art I  4 Credit Hours
Japanese art from prehistoric Jomon period to end of Edo period, including painting, sculpture, architecture, and applied arts. Cultural developments on Asian mainland will be treated to provide proper placement of Japanese art within greater East Asian cultural context. Taught at the Japan Center for Michigan Universities, Hikone, Shiga Prefecture, Japan. (F).

HUM 396  Japanese Art II  4 Credit Hours
Continuation of Japanese Art I. Historical development of Japanese painting from Asuka to Edo periods. Approach both chronological and thematic in nature. Secular and religious painting will be discussed. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Prefecture, Japan. (W).
Prerequisite(s): HUM 395

HUM 3975  Humanities Thesis/Project  6 Credit Hours
The Humanities Thesis/Project is the culmination of the Humanities concentration, normally completed in the Senior year. Students will develop either a thesis or a research project designed to integrate and deepen their study of the three disciplines chosen for their concentration. The thesis will be done under the direction of one or more faculty members in their areas of concentration. The research project will normally be done in collaboration with a faculty member or with an external organization, as approved by the student’s project supervisor. Restricted to students in the Humanities concentration who have completed nine hours of upper-division courses with a "Humanities" listing. (F,W,S).

HUM 398  Independent Studies in Hum  1 to 3 Credit Hours
Readings or analytical assignments in the humanities in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. (F,W).

HUM 399  Independent Studies in Hum  1 to 3 Credit Hours
Readings or analytical assignments in the humanities in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. (F,W).

HUM 409  Feminist Theories  3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women’s and men’s lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Students will not receive credit for both HUM 409 and HUM 509. (AY)
Prerequisite(s): WGST 275 or WST 275 or SOC 200 or SOC 201 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

HUM 415  Existentialism and Its Sources  3 Credit Hours
An exploration of existentialism through the study of literary and philosophical texts. Particular themes such as freedom, commitment, alienation, and death will be considered in an attempt to formulate an existential conception of the human condition. (OC)
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490
HUM 433  Writing Women in Renaissance  3 Credit Hours
This course will be taught in English, and will focus on the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Ariosto. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe, and Marguerite de Navarre. At issue will be women's roles and women's images in city and court culture during the early modern period, and the interaction of their writings with the literary canons of Italy and France. (OC).
Restriction(s):
Can enroll if Level is Undergraduate

HUM 434  Renaissance and Baroque Rome  3 Credit Hours
The return of the papacy in 1420 initiated the reemergence of Rome as a major cultural center. This course examines painting, sculpture, architecture, and urban planning in Rome from the 15th to the 17th century, including the work of Raphael, Michelangelo, Bernini, Borromini, and Caravaggio. Topics to be explored include the birth of Renaissance archaeology and antiquarianism; humanism and the papal curia; urban renewal and conservation; pilgrimage and sacred topography; the "myth of Rome"; architecture of churches, villas, and palaces; tourism and the city as spectacle. This course is structured as a seminar that is writing and research-intensive. It is an interdisciplinary course that includes readings in literature, religion, urbanism history of art and architecture, and intellectual history.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

HUM 457  American Cinema  3 Credit Hours
This course will analyze how Hollywood as the nation's dream factory has manufactured fantasies and cultural myths that have constructed the image of American citizenship, both for Americans and non-Americans. It will establish the ideological function of Hollywood texts as providing unifying symbols for a fragmented society. (YR).
Prerequisite(s): ENGL 248 or HUM 248 or FILM 248 or JASS 248

HUM 467  Script-Writing Workshop  3 Credit Hours
This writing intensive course will train students to compose a film script, focusing on the substance, structure, and style of an original screenplay. The course will be conducted as a workshop in which students will first study classic scripts (and films based on these) of the film-school generation of directors, then model scenes and sequences of their own scripts on the principles of the above texts, and finally, write their own respective film stories in accordance with an appropriate narrative structure and design. (YR).
Prerequisite(s): JASS 310 or COMM 310 or COMP 310 or ENGL 310

HUM 4705  Black Women / Lit, Film, Music  3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender, and class have shaped the creative work of Black women. Students will be required to read, discuss, and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash, and singer Billie Holiday.
Prerequisite(s): FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 237 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

HUM 477  Ethnographic Film  3 Credit Hours
This course will analyze ethnographic films as a medium for the construction of meaning in and across cultures. It will teach students to understand how the putatively "real" content of documentary film creates a mixture of fantasy, news and "science." Covering texts as varied as National Geographic photographic layouts, traditional ethnographic films made by anthropologists, and auto-ethnographies of cultural groups such as native Americans and the Trobriand Islanders of Papua, New Guinea, the course will aim to deconstruct such oppositions as indigene vs. alien, us vs. them, and self vs. other. Students cannot receive credit for both HUM 477 and HUM 577. (YR).
Prerequisite(s): FILM 248 or ENGL 248 or HUM 248 or ANTH 101 or JASS 248

HUM 485  Internship  3 to 6 Credit Hours
The Humanities Internship offers students experience in types of work available to liberal arts graduates. Attendance at individual conferences with the director and regular meeting of the Humanities/History Internship seminar is required. Credit applies to the degree as general elective and does not apply to concentrations, with the exception of Communications (3 credits if internship required toward major), Journalism and Screen Studies (3 credits if internship required toward major, with an additional 3 credits accepted as partial fulfillment of requirements in genres, modes and contexts), International Studies (3 credits of internship count toward cognate requirement), and Museum Studies (3 credit of internship count toward cognate requirement). Maximum total hours credit: 12. Graded Pass/Fail, (F, W, S)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

HUM 490  Topics in Humanities  3 to 4 Credit Hours
Examination of problems and issues in selected areas of the humanities. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

HUM 497  Independent Studies in Hum  1 to 3 Credit Hours
Readings or analytical assignments in humanities in accordance with the needs and interests of those enrolled and agreed upon by student and advising instructor. (YR).

HUM 499  Directed Research  1 to 3 Credit Hours
See Humanities Concentration Advisor for more information.

* An asterisk denotes that a course may be taken concurrently.
Indust & Manufac Sys Engin (IMSE)

IMSE 255  Computer Programming for Eng  3 Credit Hours
Intermediate topics in computer programming: arrays, files, structured data types, pointers, functions. Overview of digital computer hardware and system software components: machine architecture, operating systems, computer networks, data security, and performance evaluation. Prerequisite(s): ENGR 100 or MATH 105 or Mathematics Placement with a score of 113

IMSE 299  Internship/Co-Op  1 Credit Hour
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).
Restriction(s):
- Can enroll if Class is Junior or Senior or Graduate

IMSE 3005  Intro to Operations Research  4 Credit Hours
This course introduces some basic techniques or operations research used in decision making and system performance evaluation in both deterministic and probabilistic environments. Topics in linear programming, especially the simplex method with duality theory and sensitivity analysis is included. Other topics include integer programming, deterministic dynamic programming, network problems, PERT-CPM, discrete-time and continuous-time Markov chain models of random processes, queuing theory and applications. (YR)
Prerequisite(s): (MATH 217 or MATH 227) and IMSE 317*

IMSE 317  Eng Probability and Statistics  3 Credit Hours
Set theory, combinatorial analysis, probability and axioms, random variables, continuous and discrete distribution functions, expectations, Chebychev's inequality, weak law of large numbers, central limit theorem, sampling statistics and distributions, point and interval estimation and linear regression. Three hours lecture.
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215 or MATH 114

IMSE 334  Org of Hospital Systems  3 Credit Hours
The fundamental concepts of organizational behavior are explored. The interrelationships among personnel in an organization, and the functions and responsibilities of individuals are discussed. Topics studied include decision-making theory, organizational authority and adjunct responsibility, leadership and supervision. Particular emphasis is placed upon hospitals and the health care industry. Lectures are supplemented with actual case studies from the health care industry in which the student has the opportunity to apply problem-solving techniques to true-to-life situations. Three hours lecture.
Restriction(s):
- Can enroll if Class is Junior or Senior or Graduate

IMSE 350  Data Structures  4 Credit Hours
This course focuses on data design and algorithm designs. Data design topics include object-oriented discussions of hashing, advanced tree structures, graphs and sets. Algorithm design topics include the greedy, divide-and-conquer, dynamic programming, backtracking, and branch-and-bound techniques. A significant discussion of algorithm complexity theory, including time and space trade-off and elementary computability theory is included.
Prerequisite(s): MATH 115 and (CIS 200 or IMSE 200) and CIS 275

IMSE 351  Data Struc & Algorithm Analysis  3 Credit Hours
Object-oriented design, programming, and analysis techniques review; structured programming concepts; data structures; algorithm design and analysis; lists, stacks, and queues; heaps, sorting, trees, graphs, and algorithm development utilizing modern languages, such as C++, Java.
Prerequisite(s): IMSE 255 or CIS 150 or IMSE 150 or CCM 150

IMSE 352  Intro to File Processing  3 Credit Hours
File processing environment, storage media, sequential, random and indexed sequential files, inverted lists, multilists, tree structures, file control systems. Three hours lecture.
Prerequisite(s): IMSE 200 and CIS 175

IMSE 356  Real Time Computing  3 Credit Hours
Introduction to real time computing concepts applicable to discrete systems. Fundamentals of real time hardware, operating systems and C programming language. Selected coverage of instrumentation, input/output modes, data conversion, single task and multitask programming. Two hours of lecture and three hours of laboratory per week.
Prerequisite(s): IMSE 150 or IMSE 255

IMSE 381  Industrial Robots  4 Credit Hours
The course introduces students in engineering and computer science to fundamentals of robotics technology, programming and their applications in industrial environment. The emphasis will be on robotics anatomy and configurations, robotocs kinematics, and effectors, use of sensors in robotics, robotics programming, design of robot workcell, robotics applications to production problems, cost justifications and robotics safety, rather than on the extensive theory of robotics. Three-hour lecture and three-hour laboratory per week.
Prerequisite(s): MATH 115
Restriction(s):
- Can enroll if Class is Junior or Senior

IMSE 382  Manufacturing Processes  4 Credit Hours
This course introduces the students to the fundamentals and principles of manufacturing processes for engineering materials. It seeks to transfer an understanding of the application of principles of engineering materials and their influence on manufacturing processes. Topics covered include structure and manufacturing properties of metals, casting, heat treatments, bulk deformation processes, sheet metal working processes, processing of polymers and composites, surfaces and coating, powder metallurgy, machining and joining. Case studies of design for manufacturing and measurement of product quality; economical aspects and cost considerations in manufacturing systems will be studied. Three lecture hours and three laboratory hours.
Prerequisite(s): ENGR 250 and (ME 265 or ME 260)
Corequisite(s): IMSE 382L

IMSE 389  Selected Topics I  3 Credit Hours
Study of topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.

IMSE 390  Selected Topics II  3 Credit Hours
Study of Advanced topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.

IMSE 398  Independent Study in IMSE  1 to 3 Credit Hours
Individual study design or laboratory in an area of interest to the student. Contents may be chosen from any of the areas of Industrial and Manufacturing Engineering. The student will submit a report on his or her project at the end of the term. Written permission of the instructor required. (F,W,S).
Restriction(s):
- Cannot enroll if Class is Freshman or Sophomore or Graduate
- Can enroll if College is Engineering and Computer Science
IMSE 399  Internship/ Co-Op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms. 
Restriction(s): Can enroll if Class is Junior or Senior or Graduate

IMSE 400  Programming Languages  4 Credit Hours
Systematic study of programming languages with regard to their implementation, structures, and use. Languages are compared with regard to their various data types, data structures, operations, control structures, programming environments, and ease of use in solving various programming problems. 
Prerequisite(s): IMSE 350 or CIS 350 or CCM 350 
Restriction(s): Can enroll if Level is Undergraduate

IMSE 421  Eng Economy and Dec Anlys  3 Credit Hours
Study of the concepts involved in the analysis of engineering management decisions, both short and long term. Time valued investments and the effects of depreciation and taxes in comparing alternatives are discussed. Specific attention is devoted to deterministic and probabilistic replacement policies for single and chain replacements of equipment. Basic elements of utility theory are introduced. Applications of decisions under risk, uncertainty, and of game theory to capital investment, bidding, and to competitive decisions are included. 
Restriction(s): Can enroll if Class is Junior or Senior or Graduate

IMSE 437  Health Care Management  3 Credit Hours
This course is intended for those who have to deal with the administrative aspects of health care systems and not only the technical. The goal of the course is to provide the hospital staff member with an understanding of operations of the total hospital system. Topics covered include functions, problems, and organization of the medical agencies and their effect upon hospitals; methods of nursing staff organization; techniques of determining nursing staff levels; development of staff schedules; financial reimbursement and governmental regulations. 
Restriction(s): Can enroll if Class is Junior or Senior or Graduate

IMSE 440  Applied stat models in engin  3 Credit Hours
Full Course Title: Applied statistical models in engineering The course provides students with considerable experience to flexibly work with Linear Regression Models and Design of Experiments. With the growth of automated systems, data analysis became an essential tool in engineering. The first part of the course introduces students to Simple Linear Models, Multiple Linear Models, Model Evaluation, Model Diagnosis, Analysis of Variance, Residual Analysis, and Model Selection. The second part of the course introduces students to Design of Experiments and commonly used designs such as the Completely Randomized Design, Randomized Complete Block Design, and Latin Squares Design. The course also provides the students with experience handling data for engineering applications via in-class activities and assignments. Student teams complete a major data analysis project to answer a set of engineering questions and challenges. (YR) 
Prerequisite(s): IMSE 317 or BENG 364 or ME 364 
Restriction(s): Can enroll if College is Engineering and Computer Science

IMSE 4425  Human Factors and Ergonomics  4 Credit Hours
The course integrates the elements of traditional methods of engineering and time-motion studies with ergonomics and human factors concepts. Methods improvement, work measurement, and work design, applied to manufacturing and service industries, so as to increase productivity and improve worker health and safety. The topics covered include: problem solving tools; operation analysis; time-motion analysis; work sampling; manual and cognitive work design; workplace, equipment, tool and work environment design; allowances; and lean manufacturing. Lectures and laboratory. (YR) 
Prerequisite(s): IMSE 317 or BENG 364 
Restriction(s): Can enroll if Level is Undergraduate

IMSE 450  Operating Systems  4 Credit Hours
Introduction to computer operating systems. Process management, CPU scheduling, memory management, file systems and I/O devices. Advanced topics, e.g., multiprogramming and multitasking, virtual memory, deadlock, I/O, job scheduling, and performance analysis using queuing models, will be introduced. Case studies of modern operating systems. A design project is required. 
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 276 and ECE 370) and IMSE 317

IMSE 451  Computer Graphics  3 Credit Hours
The mathematics, algorithms and data structures of computer graphics programming in 2 or 3 dimensions. Applications of computer graphics in Engineering Science and Data Processing. 
Prerequisite(s): IMSE 351 or CIS 351 or CIS 350 or IMSE 350 or CCM 350

IMSE 453  Data Comm/Distributed Process  4 Credit Hours
Study of the technical and management aspects of computing networks and distributed systems. Topics include network architectures (ISO/ OSI, TCP/IP, ATM), communication hardware (transmission media, network adapters, switches), encoding, framing, error detection and correction, reliable transmission, data link control and LAN technology, internetworking, routing/congestion control, network design/ management. 
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 351 or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317

IMSE 4545  Information Systems Design  4 Credit Hours
Role of information systems in organizations. Economic factors and social impact of information systems. Phases to design an information system: systems objectives and criteria establishment, fact investigation and analysis, feasibility study, output-input design, processing design, file and database design, safety and reliability considerations, detailed systems description, programming specifications, testing analysis and design skills will be assigned. A series of cases will be used in developing an information system. SQL will be used to develop data tables and access information. Three lecture hours and one three-hour laboratory. (W) 
Prerequisite(s): IMSE 255 or CIS 205 
Restriction(s): Can enroll if Level is Undergraduate

IMSE 456  Intro to Data Base Systems  4 Credit Hours
An introduction to database system concepts and techniques. Topics covered include database environments, ER modeling, relational data model, object-oriented database, object-relational database, database design theory and methodologies, database languages, query processing and optimization, concurrency control, database recovery, and database security. 
Prerequisite(s): CIS 350 or CIS 350A or IMSE 351 or (ECE 370 and MATH 276)
IMSE 457  Compiler Design  3 Credit Hours
The design and construction of compilers and programming systems. Lexical scan; parsing techniques; code generation and optimization. Runtime organization; storage allocation. Applications of formal language theory in compiler design. Translator writing systems; XPL. Three one-hour lectures.
Prerequisite(s): IMSE 350 or CIS 350 or CCM 350

IMSE 4585  Simulation in Systems Design  4 Credit Hours
This course introduces digital simulation as a design and modeling tool. The fundamental techniques of constructing a simulation model and evaluating the results are studied. A computer simulation software is used (such as ARENA, ProModel, Witness, Simul8). Topics include random number and random variate generation, input and output data analysis, design of experiments and optimization of simulated systems, verification and validation, discrete and continuous simulation models, comparison of simulation modeling software, and applications of simulation in different industries. Students are asked to select problems of interest and present final project reports. Four lecture hours. (YR)
Prerequisite(s): IMSE 317 and IMSE 3005*
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4675  Six Sigma & Stat Proc Improv  4 Credit Hours
Review of graphical methods, probability theory and statistics (stem-and-leaf plots, histograms, scatter diagrams, counting methods, axioms of probability, common discrete and continuous probability models, expectation, linear combinations, estimation, sampling distributions, confidence intervals, hypothesis testing, and A vs. B type of experimentation for both unpaired and paired data); introduce quality terminology in manufacturing and service industry contexts, study the theory, design and application of common statistical process control models for variables and attributes; study process capability and gauge and measurement capability methods; study the design and analysis, both graphical and analytic, of statistically designed experiments (one-way completely randomized designs, and randomized, complete block designs); study the application and analysis of two-level, factorial and fractional factorial designs. Learn to apply and interpret analysis of variance to above situations. Extensive analytic homework and applications used throughout course to motivate material. Each student completes an individual project of his/her own design, subject to instructor approval, entailing a modeling application or controlled experiment where the student collects the data. Four hours lecture. (YR)
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4745  Facilities Design  4 Credit Hours
Analysis, planning and design of physical facilities utilizing research, engineering and economic principles. Synthesis of physical equipment and workers into an integrated system for either service or manufacturing activities. Design of material handling and storage systems. Layout of lean manufacturing facilities. Design of atmospheric, electrical, lighting, and life safety systems for a facility. Students are required to select problems of interest and present design project reports. (F)
Prerequisite(s): IMSE 3005*
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4795  Prod, Inven Control & Lean Mfg  4 Credit Hours
Study of concepts involved in forecasting demand, inventory control, MRP, JIT production, lean manufacturing, aggregate scheduling, and project management. The application of mathematical programming techniques, bottleneck analysis, and lean techniques such as value stream mapping, error proofing, cellular manufacturing, etc. are used in design and analysis of production systems. Use of the computer programs in the design and analysis of such systems. Students are asked to select problems of interest and present final project reports. (OC)
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4815  Manufacturing Process II  4 Credit Hours
This course introduces the students to machining processes, metal forming processes and molding and forming of plastics. Metal cutting theory is emphasized including the mechanics of metal cutting, cutting tools, measurement of tool life, selection of cutting conditions, and chip control; theory and applications of non-traditional manufacturing processes. Metal forming theory is emphasized including formability of metals; analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Basic principles of plastic molding and forming processes of plastics, ceramics and composites. (W)
Prerequisite(s): IMSE 382 or ME 381
Corequisite(s): IMSE 4675
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4825  Industrial Controls  4 Credit Hours
This course introduces the basics of calibration, error analysis, and dynamic response characteristics of instrumentation. Fundamentals of metrology include linear and angular measurements, standards, gauges, machine tool accuracy, and automation of inspection processes. The course also introduces the principle aspects of computers and their applications in system control, as well as principles of automation with emphasis on manufacturing industries. Discussion of the hardware and software associated with this task and other topics such as integrated systems modeling, sensor technologies, digital and analog signal processing and control, and information communication are also included. Laboratory exercises and projects are required. (F)
Prerequisite(s): ME 265
Corequisite(s): ECE 305
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

IMSE 4835  Comp.-Aided Prcs Desgn & Mfg  4 Credit Hours
This course focuses on the fundamentals of component and system designs through the use of Computer-Aided Design (CAD) tools. Issues related to the manufacture of molds, jigs and fixtures are also introduced and Computer-Aided Manufacturing (CAM) tools are used as means for the production of these machine components. The principles of design for manufacture and assembly as applied to tool and machine design are also discussed. Computer-Aided Process Planning (CAPP) tools, flexible manufacturing systems, and information flow in manufacturing systems are also presented. Hands-on experiments and course projects are required. (W)
Prerequisite(s): IMSE 382 or ME 381
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
IMSE 484  CA Machine and Tool Design  3 Credit Hours
Study of the fundamentals of machine tool design, cutting tools, metal forming dies, and jig fixtures for practical applications in machining and assembly. Principles of design for manufacture and assembly as applied to tool and machine design. Laboratory exercises and projects are required using computer-aided design software. Two lecture hours and three laboratory hours.
**Prerequisite(s):** IMSE 382 or ME 381
**Restriction(s):**
Can enroll if Level is Undergraduate

IMSE 486  Design for Assembly & Mfg  3 Credit Hours
This course will cover topics in manufacturing with emphasis on the parallel product design and selection of specifications for processes. Topics included are the principles of concurrent engineering, geometric dimensioning and tolerancing (GD&T), process engineering, process planning, cost estimating, and design for manufacturing. Projects using computer tools are required on a team-oriented basis.
**Prerequisite(s):** IMSE 382
**Restriction(s):**
Can enroll if Level is Undergraduate

IMSE 488  Metal Forming Processes  3 Credit Hours
This course focuses on fundamentals of metal forming processes; mechanics of metal forming; formability of materials; tool and die design; design for manufacture; and economic aspect of the process. Emphasis is placed on analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Laboratory and course project are required.
**Prerequisite(s):** IMSE 382
**Restriction(s):**
Can enroll if Level is Undergraduate

IMSE 489  Robotics Systems Simulation  3 Credit Hours
The course emphasizes the fundamentals of the design of robotics systems with the aid of robot simulation technology, structure and basic components of robots and robotics manufacturing workcells; control, kinematics, and dynamics of robots and manufacturing devices; robot accuracy and calibration of robot motion; applications of robots in manufacturing such as spot welding, arc welding, machining, assembly and CMM; robot simulation software such as ROBCAD or IGRIP. Course project is required. Available for graduate credit. (YR)
**Restriction(s):**
Can enroll if Class is Senior or Graduate

IMSE 490  Selected Topics  3 Credit Hours
Individual or group study, design or laboratory research in a field of interest to the student. Topics may be chosen from any of the areas of industrial and systems engineering including management, work measurement, methods, organization, industrial sciences, industrial mathematics, systems and procedures. If preliminary arrangements are made, the work internship periods can be used to formulate the problem and gather data. Completion of the analysis and submission of a report shall be done during the academic periods under the supervision of a faculty member or members. The student should be prepared for both a written and oral presentation of the report. This course is highly recommended as a technical elective. Permission of department.

IMSE 491  Directed Studies in IMSE  1 to 3 Credit Hours
Group study of contemporary topics in industrial and systems engineering and general systems design. Course may be elected for credit more than once under different instructors. Permission of department.

IMSE 4951  Design Project I  2 Credit Hours
Design of a system to produce or service using knowledge gained in previous courses in the program. Two two-hour lecture/lab periods. (F,W,S)
**Prerequisite(s):** ENGR 400* and (COMP 270* or COMP 106* or COMP 220*)
**Restriction(s):**
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Industrial & Systems Engin

IMSE 4952  Design Project II  2 Credit Hours
Design of a system to produce or service using the knowledge gained in previous courses in the program. It is the continuation of the project started in Design Project I course. (F,W,S)
**Prerequisite(s):** IMSE 4951
**Restriction(s):**
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Industrial & Systems Engin

IMSE 4953  Design Project in Mfge  1 Credit Hour
Design of a manufacturing system to produce product using the knowledge gained in previous courses in the program. (F,W,S)
**Prerequisite(s):** ENGR 400*
**Corequisite(s):** ME 4671
**Restriction(s):**
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Mechanical Engineering

IMSE 498  Guided Study in IMSE  1 to 3 Credit Hours
Individual study, design, or laboratory research in a field of interest to the student. Content may be chosen from any of the areas on industrial and manufacturing engineering. The student will submit a report on his or her project at the close of the term. Permission of department. (F,W,S)
**Restriction(s):**
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

IMSE 499  Internship/Co-Op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with classroom terms.
**Restriction(s):**
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Information Systems Management (ISM)

ISM 120  Bus Prob Solving w/ Comp Apps  3 Credit Hours
Full Course Title: Business Problem Solving with Computer Applications -
This course introduces students to business problems, processes, and professional practices with an emphasis on structuring and solving business problems using computer applications. Drawing on problems from a range of business disciplines such as accounting, finance, marketing, and operations management, students will define, model, and solve business problems using spreadsheet and database software. They will practice critical thinking and business communication through oral and written presentation of problem analysis and results. Credit cannot be given for ISM 120 and any of ITM 120, MIS 120, CIS 121, 122, 123. (F,W,S)

ISM 301  Bus Application Programming  3 Credit Hours
This course is an introduction to basic concepts in computer programming with an emphasis on business applications. In the course, students will develop an understanding of fundamental programming logic and learn to use basic programming structures to solve business problems. Students are introduced to program development cycle and programming principles. The course covers principles of program design, programming structures, data types and structures, program testing, and debugging. Emphasis is placed on the implementation of programs with procedural structures, along with graphical user interfaces and event driven code. Upon completion, students should be able to design, code, test, and debug programs based on business requirement using a selected programming language. Credit cannot be given for both ISM 301, ITM 301 and MIS 301.

ISM 302  Object-Oriented Programming  3 Credit Hours
This course introduces the basic concepts of object-oriented programming with an emphasis on business applications. Students will develop an understanding of object-oriented modeling and learn to use object-oriented analysis and design techniques to solve simple business problems. Students are introduced to OO application development methodology and environment. The course covers principles of object-oriented programming, objects and classes, abstract data types, implementation of inheritance and polymorphism, database access, and graphic user interfaces. Upon completion, students should be able to design, code, test, and debug programs based on business requirements using a selected object-oriented programming language. Credit cannot be given for both ISM 302, ITM 302 and MIS 302.
Prerequisite(s): ITM 301 or MIS 301 or ISM 301
Restriction(s):
Can enroll if Level is Undergraduate

ISM 303  iCreate: Mobile Apps  3 Credit Hours
In this course, the technologies of mobile computing are introduced. Prior knowledge of programming logic and object-oriented concepts are applied in building mobile applications. Topics include mobile development environment, user interface elements of a mobile device, gesture, location awareness, and file operations. Creative thinking and entrepreneurship are introduced and fostered via creating a student-initiated mobile application from idea to sale.
Prerequisite(s): ITM 301 or ISM 301
Restriction(s):
Can enroll if Level is Undergraduate

ISM 310  Info Systems in Management  3 Credit Hours
This course provides an overview of information systems in the business world. It presents an organizational view of how to use information technology to create competitive firms, manage global organizations, and provide useful products and services to customers. Topics include hardware, software, databases, telecommunications systems, the strategic use of information systems, the development of information systems, and social and ethical issues involved with information systems. Credit cannot be given for ITM 310, ISM 310 and MIS 310.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ISM 311  Mgmt Information Sys Lab  1 Credit Hour
ISM 311 is a lab component of ISM 310. Students will complete weekly laboratory assignments to reinforce the concepts of ISM 310 to use information technology to solve business problems. In addition, the use of several common applications (e.g., Word, Excel, Access, and PowerPoint) will also be covered at the beginning to advanced levels.
Prerequisite(s): ITM 310* or ISM 310*
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Business

ISM 321  Database Systems I  3 Credit Hours
This course examines the processes and tools used to design and implement database systems in business. The goal of this course is to provide adequate technical detail while emphasizing the organizational and implementation issues relevant to the management of computerized data in an organizational environment. A class project involving the design and implementation of a database using a microcomputer database management system is performed. Topics include concepts of database systems, conceptual database design, logical database design, physical database design, database implementation, and data retrieval. Credit cannot be given for ISM 321, ITM 321, MIS 321 and CIS 421.
Prerequisite(s): ITM 310 or MIS 310 or ACC 380 or ISM 310

ISM 331  Info Systems Development  3 Credit Hours
This course provides a foundation in systems analysis and design concepts, methodologies, techniques, and tools. Students will learn to analyze an organizational problem, define user requirements, design an information system, and plan an implementation. Methodologies covered will include the traditional life cycle approach as well as newer methodologies such as object-oriented approach, joint application development (JAD), and prototyping. A semester-long project gives students the opportunity to apply these techniques to a business problem. This project will use technologies such as a computer-aided software engineering (CASE) tool, a database management system (DBMS), or a fourth-generation language. Credit cannot be given for ISM 331, ITM 331 and MIS 331.(F,W,S)
Prerequisite(s): (ITM 310 or ISM 310 or MIS 310 or ACC 380) and (ITM 321 or MIS 321 or ISM 321*)
Restriction(s):
Can enroll if Level is Undergraduate
ISM 343  Social Network Analysis  3 Credit Hours
This course provides students an introduction to the study of social networks and tools used to analyze such networks. The course will focus on understanding the causes and consequences of the patterns of relationships between individuals. Topics will include the small-world puzzle (six degrees of separation), the strength of weak ties, the spread of ideas through social networks, and related security applications. This course will examine data analysis techniques used by social network researchers and developers of social media websites. Concepts will be applied both with software and at small-scale with manual calculation.
(F,W,S)
Prerequisite(s): ISM 310 or ITM 310

ISM 347  Information Visualization  3 Credit Hours
Full Course Title: Information Visualization: Business Insight via Storytelling Information visualization has been used greatly in various disciplines including media, business, and engineering. It is valuable in helping people analyze and understand information to lead to better solutions and decisions. This course will introduce students to the field of information visualization via a hands-on approach. Readings and lectures will provide an overview of the field. Students will learn visualization design and evaluation principles and learn how to acquire, parse, and analyze large datasets. Students will also learn tools and techniques for visualizing multivariate, temporal, text-based, geospatial, hierarchical, and network/graph-based data. (F,W,S)
Prerequisite(s): ITM 301 or ISM 301 or MIS 310 or ACC 380

ISM 351  Networking and Collab Comp  3 Credit Hours
This course provides an introduction to data communication, networks, distributed processing and collaborative computing. The course will study the technical and management aspects of computing networks and distributed systems supporting a wide range of organizational functions from organizational process to managerial strategic decision making, from personal to group to organizational computing. The applications of telecommunications in the work settings and management issues of telecommunications will be addressed. The social and organizational implications of the telecommunications technology are also examined. Credit cannot be given for ISM 351, ITM 351 and MIS 351.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 371  IT Strategy: Disrupting Norms  3 Credit Hours
Full Course Title: IT Strategy: Disrupting Industry Norms, Practices, and Structures: Businesses are in the early stages of an information revolution whereby IT is transforming industries, generating whole new human communities, creating new markets, and redefining basic business models. These disruptions, driven by IT, are becoming more and more common and have resulted in the emergence of new regulations, behaviors, and norms. When IT disrupts an industry, the fundamentals of the business models change in ways which are not immediately obvious. The emphasis of this course is on managerial and industry issues with a focus on the transformations of business models over the last ten years. Throughout this course you will be exposed to how these changes in business models are put into practice through specific features in the technology. Topics include platform competition, network effects, pricing models for digital goods, the sharing economy, the wisdom of crowds, the long-tail effect, the social network perspective, and technology adoption. (YR)
Prerequisite(s): ISM 310 or ITM 310 or MIS 310 or ACC 380

ISM 381  Info Systems Project Mgmt  3 Credit Hours
This course examines the management of information system projects in business organizations as well as human and organizational reactions to the changes brought about by new information systems. Topics include project planning, project controls, project reporting, information system projects and organizational changes, factors affecting project success and failure, and project management software.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 382  Advanced Computer Applications  3 Credit Hours
This is an advanced course in computer applications, decision modeling, and business problem-solving. Topics will include Visual Basic for Applications (VBA), pivot tables, user interfaces, and application manipulation techniques for both spreadsheet and database applications. Complex formulae will be introduced to enable students to create sophisticated models for solving nested and complex business problems. Credit cannot be given for ITM 382, ISM 382 and MIS 382.
Prerequisite(s): ITM 120 or ISM 120 or MIS 120 or (ITM 310 and ITM 311) or (ISM 310 and ISM 311) or MIS 310 or (ACC 380 and ACC 381)
Restriction(s):
Can enroll if Level is Undergraduate

ISM 383  Info Technology Security  3 Credit Hours
This course provides a foundation of IT security, methodologies, techniques, and tools. This course will cover both the managerial and technical sides of IT security. Topics include: security costs and benefits, information assets, security threats, network attacks, security planning, incident response, disaster recovery, and training. Hands-on lab sessions, interactive lectures, discussions, and guest speakers will be used throughout the course.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 387  Digital Security  3 Credit Hours
Full Title: Digital Security: Threat Prevention and Management The ability to secure information within a modern enterprise-large or small-is a growing challenge. Threats to information security are global, persistent, and increasingly sophisticated. This course provides the practices and methods currently used by information security professionals to manage and secure an information environment. Topics includes security strategy and policies, security operation center (SOC), network security, physical security, malware countermeasures, operational systems security, risk analysis and incident response practices. (F,W,S)
Prerequisite(s): ITM 383 or ISM 383

ISM 431  Database Systems II  3 Credit Hours
This capstone course will provide an opportunity for students to work as a member of a project team on a complex, real-world information systems project. The course examines the processes and tools used to develop, implement and administer database systems in business. A class project involving the development of a database using a client/server database management system is performed. Project management methodologies and tools used to manage complex information systems projects are also applied in the course.
Prerequisite(s): ITM 321 or ISM 321 or MIS 321

ISM 491  Seminar: Manag Info Systems  3 Credit Hours
To provide students with an opportunity for intensive study in current areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
International Business (IB)

IB 441  International Financial Mgmt  3 Credit Hours
The objective of this course is to orient students to the increasingly internationalized financial environment in which business operates. As such, it attempts to broadly survey topics that frequently confront decision makers in financial management. These topics include the balance of payment mechanism, international capital flow, international monetary system and financial institutions, the mechanics of foreign exchange markets, international credit and capital markets, and financial problems of multinational business.
Prerequisite(s): FIN 401 and (DS 300 or DS 302*)

IB 446  International Business  3 Credit Hours
Designed as a survey course, International Business attempts to broadly cover the essential elements of international business. Topics will include: business in an international environment, theories of international trade and investment, international finance, corporate policy and strategy, functional management and operations, and international business relationships.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

IB 486  Seminar: International Bus  1 to 3 Credit Hours
This course explores issues of major importance to international banking. Topics discussed include the global banking environment, the operations of international commercial and investment banks, regulatory issues affecting the global banking industry, and international money and foreign exchange markets. The role, successes and weaknesses of multinational institutions for economic development are discussed along with the recently proposed reform measure. Students taking this course should expect to learn about the various categories of international lending and loan syndication, asset-related and project financing, international retail and private banking. They will gain skills in the various lending techniques practiced in global banking, and will obtain a better grasp of the problems facing international banking institutions today as a result of the continuous globalization of financial markets and the ever increasing consolidation of the industry.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

IB 496  Research: Int Business  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Japanese (JPN)

JPN 128  Beginning Japanese I  5 Credit Hours
Japanese instruction at the beginning level. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Japan. Seven contact hours per week. (F).

JPN 129  Beginning Japanese II  5 Credit Hours
Continuation of JPN 128. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Japan. Seven contact hours per week. (W).

JPN 178  Accelerated Japanese I  5 Credit Hours
A demanding course that brings a student with little or no knowledge of Japanese through the beginning level into the intermediate level. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Japan. Seven contact hours per week. (F).

JPN 225  Accelerated Japanese II  5 Credit Hours
Continuation of JPN 128. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Japan. Seven contact hours per week. (F).

JPN 228  Intermediate Japanese I  5 Credit Hours
Japanese instruction at the intermediate level. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Japan. Seven contact hours per week. (F).

JPN 229  Intermediate Japanese II  5 Credit Hours
Continuation of JPN 228. Taught at the Japan Center for Michigan Universities, Hikone, Shiga, Japan. Seven contact hours per week. (W).

JPN 230  Contemp Iss Japanese Politics  3 Credit Hours
This course introduces students to modern Japanese politics. It combines a comprehensive survey of Japanese political systems and structures with an introduction to some of the key areas of controversy and debate in Japan today ranging from debates about the environment to Japan's place in the world.

JPN 231  Intro. to Japanese Lang. & Cul  3 Credit Hours
During the first three weeks of the program, students participate in a beginner-level Japanese language and culture course. This course integrates classroom learning with practice of new language skills and cultural knowledge during cultural activities, field trips and other activities.
JPN 232 Comparative Health Care 3 Credit Hours
This course acquaints students with Japan’s unique health care system and how it compares to other models. Team-taught by professionals from Japan and the U.S., the course is augmented with a variety of site visits and guest lecturers.

JPN 233 Observ. Health Care Exp. 2 Credit Hours
Coordinated and supervised by the Shiga University of Medical Science (SUMS), students will spend a week in the SUMS teaching hospital observing and learning from doctors, nurses, graduate students, researchers and professors in their field of interest. Past observational studies have included experiences in nursing, radiology, physical therapy, intensive care, surgical units and more.

JPN 234 Japanese Economy & Business 3 Credit Hours
In this course, students can obtain fundamental knowledge on stylized facts of Japanese economy and Japanese firm systems as compared with those in the US and some other countries, and understand economic theories to put profound interpretations on them. Stylized facts seem to be old and some of them may have been obsolete, although they contain essential logical points. However, they are still useful for understanding Japanese economic systems. Thus, students are required to discuss current conditions on Japanese economy and firm system, considering stylized facts and theoretical backgrounds. It is essential to distinguish between changing phenomena and unchanged principles. Students have an opportunity to take a tour to a factory in a leading company. In the final class, students have to give team presentations and individually submit a short essay on the topics provided or the ones they come up with. As for the structure of classes, we cover fundamental stylized facts, economic theories (or theoretical frameworks), and data analyses (historically and currently). This course is composed of three parts: (1) Japanese economic system, (2) Japanese firm system and (3) Japanese macroeconomic conditions.

JPN 395 Japanese Society & Culture I 4 Credit Hours
Focused on modern Japan, the course will include Japanese geography and ethnography, with an emphasis on the Japanese idea of homogeneity. Japan’s role in the international context will also be examined. Classroom work will be combined with field trips, in a writing-intensive approach. Taught at the Japan Center for Michigan Universities, Hikone, Shiga Prefecture, Japan.

JPN 396 Japanese Society & Culture II 4 Credit Hours
The prehistoric and historic roots of Japan. Political economy of contemporary Japan and future directions for the country. Classroom work will be combined with field trips, in a writing-intensive approach. Taught at the Japan Center for Michigan Universities, Hikone, Shiga Prefecture, Japan.

JPN 397 Cross-Cult Business Comm/Japan 3 Credit Hours
This course is to immerse students in cross-cultural communications within a Japanese context. The students explore the dimensions of culture through classroom/community activities, case studies, worksites, panel discussions, peer-led activities and simulations. Taught at the Japan Center for Michigan Universities.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Journalism and Screen Studies (JASS)

JASS 205 Fundamentals of Journalism 3 Credit Hours
Study and practice in newspaper reporting and news gathering, interview techniques, and basic newswriting skills. Students will also discuss libel law, ethics, and the use of the Freedom of Information Act. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 240 Film and Society 3 Credit Hours
A survey of the major genres of film, chiefly in historical and political perspective, but also in the light of important intellectual frameworks (e.g., feminism, psychoanalytical theory). The films selected, both Western and non-Western, will be examined both for their visual codes of meaning and for their wider role in developing a powerful social language in various cultural contexts. (YR).

JASS 248 Introduction to Screen Studies 3 Credit Hours
This course will introduce students to the development of world cinema by integrating the aesthetics of film with its technology, and its social and economic milieu. It will train the students in analyzing the formalist qualities of the medium, and in understanding the evolution of its various genres and styles. (YR)

JASS 3015 Advanced Reporting 3 Credit Hours
Advanced study and practice in news reporting and writing. Students will gain experience with in-depth reporting through coverage of developing news stories. Longer articles of publishable quality are required. (OC).
Prerequisite(s): COMM 2015 or JASS 2015

JASS 302 Media Law and Ethics 3 Credit Hours
The basis of reportorial journalism is its foundation in the First Amendment. This course examines the legal restrictions and freedoms governing print media and explores the ethical responsibilities of print journalists. Specific topics covered include First Amendment law, the clear and present danger standard, defamation and libel, privacy, obscenity, free press/fair trial, access, shield laws, and journalism ethics.

JASS 303 Media Design & Animation 3 Credit Hours
This course will introduce students to the fundamentals of graphic design in a convergent media landscape, with an emphasis on animation and motion graphics. Students will develop skills in the fundamentals of color, typography and layout, as well as build practical skills in animation technique. Animation projects may include animated lower thirds, motion graphics, kinetic typography or 2d/3d character animation, with applications for film, television and the web. Students may not receive credit for both JASS 303 and JASS 250 (F;W;S).
Restriction(s):
Cannot enroll if Class is Undergraduate NCFD or Post-baccalaureate NCFD or Specialist or Undergrad Certification only or Post-baccalaureate Cert only or Graduate or Doctorate

JASS 307 Copy Editing 3 Credit Hours
Course covers manuscript and electronic editing of news and feature stories, editing for libel and taste, fact-checking, writing headlines and captions, and use of reference books. Includes a review of grammar and work usage, punctuation, spelling, and style.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
JASS 310 Narrative Journalism 3 Credit Hours
Students learn to identify, understand and use the techniques of fiction in the service of nonfiction material. While studying the texts as literature, students are also encouraged to view them as models for writing. Assignments include the writing and revising of articles, based on research and interviews, and writing in story form, drawing on literary techniques. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 312 Media Performance 3 Credit Hours
This course focuses on voice, diction, and movement for the various media of electronic and digital production. The emphasis is on developing skills in announcing, news reading, on-camera stand ups, voice-overs as well as dramatic interpretation and performance. Students will be exposed to a variety of projects and assignments, along with strategies for developing on-air personalities, voices, and characters. Basics of professional dress and makeup will also be discussed. Students will be expected to submit a professional portfolio of their on-air work at the end of the semester. (AY)

JASS 315 Media Productn for Metro Comm 3 Credit Hours
This community-based course partners with a community organization to produce media projects that serve the needs of the organization. Students will build skills in intermediate aspects of media production including concept development, research, proposals and pitching, scriptwriting, producing, shooting, editing, and sound design, as well as professional and organizational communication skills. Students will also develop a broader understanding of community engagement, citizenship, and issues impacting the Detroit Metro community. Productions will include both studio experience and fieldwork.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 330 Feature Writing 3 Credit Hours
An introduction to the writing of feature stories for newspapers and magazines. Students study methods of gathering information and of preparing a manuscript for publication. (AY).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 331 Online Reprtng,Rsrch,Writing 3 Credit Hours
Course introduces the technical, social, legal and ethical practice of online research, focusing specifically on reporting (i.e. research and interview) skills required by journalists and others. Students use new media technology to generate ideas, to research subjects, and to develop general-audience writing projects in their areas of interest. Course covers the use of Web search engines, directories and databases; finding sources and interviewing people online; evaluating the credibility of online sources and information; using Lexis-Nexis to access archives and public records; and using spreadsheet and database programs.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 332 Creating the Graphic Novel 3 Credit Hours
This course focuses on the creation of an original graphic novel from inception to fully developed story. Students work on character, plot development, dialogue, drawing style, and layout planning, and are encouraged to introduce any cross-disciplinary techniques such as digital applications when appropriate. Lectures and readings consider contemporary media.
Prerequisite(s): ART 202 or ART 206
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 333 Sports Reporting and Writing 3 Credit Hours
In this course, students not only learn how to write a sports story and report it across a variety of media, they also examine and write about relevant issues, from race and gender to sportsmanship and hero worship. In addition to assigned class readings, students read and report on one sports-related film and one book, chosen from a list of classics posted on CTools, and write a final paper in which they address an issue relevant to sports reporting. Local and national practitioners contribute their thoughts on a variety of subjects throughout the term.
Prerequisite(s): JASS 2015
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 334 Science and Environmental Jour 3 Credit Hours
This course introduces the practice and theory of science and environmental journalism. Students report and write short science and environmental articles across a variety of media. They also examine the history, ethics and politics of environmental and science journalism and isolate a relevant issue as the focus of a research project, which will later generate a longer science/environment feature story. After instructor critique, students revise all work and submit a final ePortfolio.
Prerequisite(s): JASS 2105
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 335 Multimedia and Music 3 Credit Hours
In this course, students will explore case studies of music created, performed, and distributed in combination with other media from the 1960s to the present. Multimedia is understood as any context in which several media are integrated, but particular focus will be paid to technological and creative innovations (such as video games, computers, and phones). The use of music will be considered in such media as film and television, multimedia performance and installation art, and international developments in multimedia production and distribution.
Prerequisite(s): MTHY 100 or MTHY 101 or MTHY 102 or MHIS 100 or MHIS 120 or MHIS 130 or MHIS 150

JASS 336 Film and Music 3 Credit Hours
In this course, students will be introduced to the varieties of music used in film from c. 1900 to the present. Topics covered include a basic introduction to the musical features of Western European dramatic music; the role of music in the early decades of the 20th century; the growth of film and musical sound in the "classic era" of Hollywood film; the use of music in specific genres such as film noir, science-fiction, epic, and musicals; and the use of popular song in film. Prerequisite: previous completion of MHIS 100, 120, 130, or by permission of the instructor.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130

JASS 338 Business/Automotive Reporting 3 Credit Hours
This course covers two inter-related areas: finance and automotive journalism. Students learn how to cover the economy and business community, focusing on areas such as Wall Street, economic indicators, stocks and bonds. Since the University of Michigan-Dearborn is located in the heart of the world automotive industry, the course also emphasizes the skills necessary for a career in automotive journalism, specifically how to read and report auto-related financial, environmental, safety, labor, finance and manufacturing documents. An introductory course in Economics is recommended.
Prerequisite(s): JASS 2015
JASS 345  Audio Production  3 Credit Hours
This hands-on course will introduce students to the basic theories of audio and audio program production, including the fundamentals of digital audio and studio and remote recording. The course is designed to instill upon students the importance of sound in the electronic media and how its use or misuse can enhance or detract from media productions. Readings, lectures and projects are designed to teach students how to discern good audio from bad and how to avoid pitfalls media producers and directors commonly make. Through the practical application of audio concepts in the radio laboratory and through critiques of radio projects and programs, students will gain the insight and experience they will need to successfully design and execute audio strategies for the electronic media.
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 350  Digital Film & Television  3 Credit Hours
Media production taught in the context of the history, aesthetics and technologies of film and television. Purpose of the course is to provide students with a working knowledge and critical awareness of digital production through classroom instruction and studio training. Course counts toward minor in Communications. (YR)
Prerequisite(s): (ENGL 248 or HUM 248 or JASS 248 or FILM 248)

JASS 357  National Cinemas  3 Credit Hours
This course will introduce students to the national cinemas of a select country. In contrasting the evolution of cinema in the East, with the dominant genres and conventions of Hollywood, the course will enable students to critically examine non-Hollywood narratives; the interaction of various nationalist movements within the institution of cinema; and the ways in which world cinema has been inflected by various indigenous performance practices and other visual representations. (OC).
Prerequisite(s): HUM 240 or JASS 240 or FILM 240 or ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 370  Narratives of Film and Lit  3 Credit Hours
Explores the narrative conventions of literary and filmic fictions in a cultural, historical and psycho-analytical context. The course goes beyond a discussion of the relative merits of novels and their respective film adaptations and examines the more complex interchanges between the two narrative forms; the ideological function of narrative in contemporary society; and the effect of the medium of a fictional text on the reader/viewer. (OC).
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 378  History of U.S. Broadcasting  3 Credit Hours
A survey of the history of broadcasting in the United States, from the development of radio at the turn of the 20th century to the rise of cable television in the late 20th century. The course focuses on the business, political and demographic factors guiding the various broadcast industries; the development and shifts of programming genres over time; and a wide look at the social impact of broadcasting in the country.

JASS 380  History of American Journalism  3 Credit Hours
This course surveys the history of American journalism from the Colonial period to the present. Topics explored include the development of print journalism, the rise of the reading public, the growth of advertising, photojournalism, and the tabloid press, and the evolution of electronic journalism from radio and television through the computer age. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 381  Postwar European Cinema  3 Credit Hours
The course will concentrate on a series of films from various European countries with a focus on the socio-political issues, historical events and cultural preoccupations that have defined and also challenged European societies from WWII to the present. Zeroing in on the construction of European identities, the course will analyze and compare modes of narrating national, class, racial, sexual and social differences in different European nations. Themes such as memories of war and the Holocaust, new conflicts, class, immigration, women's rights, gender, and East-West relations will be addressed. The course will thus privilege a cinema that offers a "récit," a story. Particular attention will be given to discourses on otherness and on the ways in which film culture has reflected, reinforced, reshaped and, in some instances, contested Europe's past and current dominant ideologies, and identities. Readings by cultural historians and analysts will provide the context for an understanding of the films. The course will conclude with a discussion of the possible existence of a specific postwar European Cinema.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 385  Black Cinema  3 Credit Hours
This course will examine selected films from African American and African film traditions in order to analyze how their cultural production is responsive to the conditions of social oppression, economic underdevelopment, and neo-colonialism. How film traditions define "Black aesthetics" will also be discussed. (AY).

JASS 387  Gender, Sex, Power Screen Studies  3 Credit Hours
This course examines representations of gender and sexuality across multiple screens, with a particular emphasis on Hollywood, independent, and non-Western cinema. In addition, the course explores intersections of gender with race, class, and ability to further investigate power structures in contemporary screen studies. The course will engage with a range of debates in film theory and women's and gender studies, and enable students to apply concepts and theories to specific media texts.
Prerequisite(s): HUM 240 or JASS 240 or ENGL 248 or HUM 248 or JASS 248 or FILM 240 or FILM 248 or FILM 240 or FILM 248 or WGST 275 or WGST 303 or ANTH 275 or ANTH 303 or PSYC 275 or PSYC 303 or SOC 275 or SOC 303 or WST 275 or HUM 275 or HUM 303

JASS 390  Topics in JASS  3 Credit Hours
Examination of problems, issues, technology and critical issues in advanced subject areas in journalism and screen studies. Title as listed in schedule of classes changes according to content. Course may be repeated for credit when specific topics differ.
Restriction(s):
Can enroll if Class is Junior or Senior

JASS 398  Independent Study in JASS  1 to 3 Credit Hours
Readings, supervised practice or analytical assignments in Journalism and Screen Studies, determined in accordance with the needs and interests of those enrolled. May count toward JASS minor.
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Arts, Sciences, and Letters

JASS 401  Interpretive Journalism  3 Credit Hours
A study in the reading and writing of newspaper columns, editorials and reviews. Course prepares students to write newspaper columns as well as reviews and interpretive pieces on the arts. It examines current writing on literature, drama, cinema, graphic arts and music, and includes a study of the newspaper/magazine column.
JASS 402  Investigative Reporting  3 Credit Hours
A course in investigating a subject and writing a publishable story. Course covers the rudiments of investigative reporting: preliminary research, story selection, investigative strategies and resources, interviewing, and evaluation of material. Examines the history and current status of investigative reporting, including its ethics and politics. Students write and edit several articles and focus on two longer investigative pieces. (YR)
Prerequisite(s): COMM 2015 or JASS 2015

JASS 403  Issues in Cyberspace  3 Credit Hours
This course will explore some of the current social, political, legal, and technological issues associated with the use of new media technology to move ideas and information in a democratic society. Examples of areas to be explored include the Internet and World Wide Web, privacy, the future of the mass audience, and the meaning of the First Amendment in the 21st Century. Students cannot receive credit for both COMM 403 and COMM 503. (OC)
Restriction(s):
Cannot enroll if Class is Graduate

JASS 404  Video Game Studies & Criticism  3 Credit Hours
This course will explore some of the current social, cultural, legal, and aesthetic issues associated with video games as an immensely popular new media technology that has sparked a dynamic user culture. Examples of areas to be explored include ludology and narratology, narrative architecture and game spaces, ethical questions and controversies, and player experience and communities. (YR)

JASS 405  New and Emerging Media  3 Credit Hours
This workshop-oriented course focuses on expanding conceptual and technical skills in emerging forms of media storytelling in an online context, including interactive narrative, collage, database cinema, eBooks, and apps for mobile devices. The course integrates a range of software and interfaces with an emphasis on the conceptual and creative applications of these tools. Students may not receive credit for both JASS 405 and COMM 405. Students who have taken JASS 405 under the course title "Web Design" are not allowed to take the course for credit again under the title "New and Emerging Media."
Prerequisite(s): (COMP 106 or Placement Score with a score of 40) and (JASS 345 or JASS 350)

JASS 406  History & Theory of Documentary  3 Credit Hours
This course surveys the history of European documentary and explores its ethical, legal and economic issues. Students study documentary's central moments, forms and artists; the changing theoretical approaches to documentary making; and the range of documentary purposes (informational, educational, propagandistic, entertainment). The course also provides historical and theoretical background for those students who wish to pursue their interest in documentary in the script-writing and production courses also offered in the Journalism and Screen Studies Discipline.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

JASS 410  Advanced Media Production  3 Credit Hours
The course covers advanced concepts in media production and provides a pre-professional opportunity to direct. Elements include scripting and organization, producing, and post-production editing techniques. Emphasis is placed on individual and small group work in both field and studio settings, leading to the creation of a professional broadcast-quality portfolio program or segment. May be repeated once for credit.
Prerequisite(s): JASS 350 or COMM 350 or JASS 405 or JASS 406 or JASS 345

JASS 413  Photojournalism  3 Credit Hours
A hands-on digital imaging course in which students learn the basics of photojournalism and photography, including subject selection, composition, cropping, retouching and caption writing.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

JASS 421  Environmental Filmmaking  3 Credit Hours
Environmental Filmmaking combines theory and practice in the examination of issues related to the environment and ecology as represented in film and television. Students will analyze the medium's ability to effectively communicate and integrate scientific and technical information about the natural world to target an audience. The course will include online screenings selected from a variety of eras and genres, readings in the field of eco-criticism, the development of a documentary treatment and the production of an original multimedia project focusing on an environmental issue. (F, AY)
Prerequisite(s): JASS 248 or ENST 301

JASS 436  Memoir and Travel Writing  3 Credit Hours
A course in narrative non-fiction that focuses on memoir and travel writing. Reading involves several books as well as classic essay-length examples. Assignments include both short analytical papers and the writing and revising of three original articles, based on research, interviews, memory, and observation, and drawing on literary techniques. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Placement Score with a score of 40 or COMP 280

JASS 440  Theory of the Screen  3 Credit Hours
A study of the art, technology, language and theory of the screen arts through an analysis of their formalist elements and medium-specific codes. Film language, representations of art and reality, authorship, spectatorship and globalization are among the core concepts that will be examined. The course includes extensive online screenings of a variety of films encompassing a number of different forms and genres. (F)
Prerequisite(s): JASS 248 or ENGL 248 or HUM 248 or FILM 248

JASS 457  American Cinema  3 Credit Hours
This course will analyze how Hollywood as the nation’s dream factory has manufactured fantasies and cultural myths that have constructed the image of American citizenship, both for Americans and non-Americans. It will establish the ideological function of Hollywood texts as providing unifying symbols for a fragmented society. (YR)
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or FILM 248
JASS 477  Ethnographic Film  3 Credit Hours
This course will analyze ethnographic films as a medium for the construction of meaning in and across cultures. It will teach students to understand how the putatively "real" content of documentary film creates a mixture of fantasy, news and "science." Covering texts as varied as National Geographic photographic layouts, traditional ethnographic films made by anthropologists, and auto-ethnographies of cultural groups such as Native Americans and the Trobriand Islanders of Papua, New Guinea, the course will aim to deconstruct such oppositions as indigene vs. alien, us vs. them, and self vs. other. Students cannot receive credit for both FILM 477 and FILM 577. (AY).
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or ANTH 101 or FILM 248

JASS 497  JASS Thesis  3 Credit Hours
A thesis project that is the culmination of the Journalism and Screen Studies major. Students choose the project area and write a thesis (40-50 pages) under the direction of a JASS faculty member. The thesis option is available only to students with substantial practical experience in the field of journalism or screen studies, and requires the approval of the JASS faculty. This course is available only to Junior/Senior students majoring in the JASS program.
Prerequisite(s): JASS 2015 and JASS 248 and JASS 310
Restriction(s):
Can enroll if Class is Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Latin (LAT)**

LAT 101  Beginning Latin I  4 Credit Hours
An introduction to reading and translating Latin. The strong influence of Latin on the formation and meaning of English (as well as French, Spanish, and Italian) will be used to illuminate the importance of Latin for understanding western languages and thought. Literature appropriate for the level will be read. (F).

LAT 102  Beginning Latin II  4 Credit Hours
A sequel to Beginning Latin I. Literature appropriate for the level will be read. (W).
Prerequisite(s): LAT 101

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Law & Environment (LE)**

LE 252  Personal Business Law  3 Credit Hours
This course is designed for the non-business student and includes business law topics of direct interest in the management of personal business affairs. Topics covered are: product safety regulation, contracts, personal property, real estate, mortgages, landlord-tenant, wills and estates, insurance, employer-employee relations, unfair business practices, and an introduction to the lawmakering and enforcement processes.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior or Graduate

LE 253  Business Law  3 Credit Hours
To introduce students to laws and regulations that impact the business environment. Topics include business litigation, the regulatory environment, contracts, sale of goods, and legal considerations in dealing with employees, competitors, suppliers and customers. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman

LE 452  The Legal Environment of Bus  3 Credit Hours
To introduce the management student to the functioning of legal systems and the effect of regulation on the business environment. Topics covered include an exploration of legal and ethical forces that impact the policy and practice of business in dealing with customers, employers, owners, and competitors.
Prerequisite(s): COMP 106 or COMP 270 or COMP 280 or COMP 220 or Composition Placement Score with a score of 40
Restriction(s):
Can enroll if Class is Junior or Senior

LE 453  Business Law: Advanced Topics  3 Credit Hours
To study advanced topics in business law, including sales, secured transactions, and other portions of the Uniform Commercial Code; advanced topics in contract law; the legal advantages/disadvantages of various types of business entities, and legal steps in formation and governance; aspects of corporate law; the law of agency; and other selected topics.
Prerequisite(s): LE 452
Restriction(s):
Can enroll if Class is Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

**Liberal Studies (LIBS)**

LIBS 101  Foundations of Academic Success  1 Credit Hour
This course is intended to introduce students to the nature and purpose of higher education, and of academic inquiry. Academic planning, information literacy, bibliographic search techniques and the evaluation of electronic information are discussed.
LIBS 111  To Infinity and Beyond  3 Credit Hours
In this seminar we explore the emergence and evolution of concepts surrounding zero, infinity, and dimension. These mathematical topics are introduced in a historical context as the by-products of human enterprise. Students study foundations of number systems, investigate objects with fractional dimensions, gain an understanding of logic as it applied to proof methodology, and develop visualization skills, creating a tangible experience with abstract mathematical objects and concepts. The supporting material is drawn from selected readings, as well as films and videos. (F).
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

LIBS 112  Car Culture  3 Credit Hours
A study of the impact of the automobile on contemporary American culture and society using the concepts and approaches of the multidisciplinary field of Science and Technology Studies. The course examines the social contexts and consequences of how cars are designed, assembled, marketed, driven, and regulated; their role in shaping individual, group, and national identity; and their place in the American imagination. (F).
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

LIBS 113  The World in a Grain of Sand  3 Credit Hours
From a single artifact (an object or a text), students will learn to build an understanding of an entire culture in a given historical moment. First by analyzing the artifact and then by building a larger context in which to interpret the significance of that artifact, students will also build their own academic community. By the end of the course, each student will have mastered the use of all library research resources and have developed a specific expertise in an area of research related to the artifact. By the end of the course, the class will have organized its own academic conference on the artifact in which they will share their research and insights. The professor will be a specialist in the area from which the artifact is selected and will guide you in your mastery of research skills and acculturation to academic life. (F).
Corequisite(s): COMP 105, COMP 106
Restriction(s):
Can enroll if Class is Freshman

LIBS 114  The Roots of American Activism  3 Credit Hours
This course examines the history, rhetoric, and social context of American citizen activism in the nineteenth and early twentieth centuries. Topics will include African American abolitionist and civil rights activism, women's suffrage, the home economics movement, the labor movement, educational reform, and student political involvement on college campuses. We will also pay special attention to how these movements played out locally. Our goal throughout will be to understand how ordinary citizens used language to effect social change - and how we today might do the same. (F)
Corequisite(s): COMP 105

LIBS 115  Shakespeare: Stage/Page/Screen  3 Credit Hours
What has made the plays of Shakespeare so relevant to a well-rounded education in universities around the world? How do Shakespeare's plays transcend his period making him, in Ben Jonson's words, "not of age, but for all time"? In this course we shall discuss the literary, stage and film traditions of Shakespeare's plays as well as the wholesale borrowings from, echoes and parodies of them in popular culture, from Dr. Who to graphic novels, and the commercialization of Shakespeare in such unlikely mediums as Levis jean commercials. This course challenges students to consider how the medium of the artistic work (e.g. film, play, illustration) affects interpretation and how the artistic work is conditioned by the social contexts of its time. From comic books to live performance, Slings and Arrows to Kenneth Branagh, this course explores the textual, performance and visual history of a selection of Shakespeare's plays and the cultural signifigance of Shakespeare today. Note: the course will include an excursion to see a play at the Stratford Shakespeare Festival in Ontario, Canada.
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

LIBS 116  Fast Food Nation  3 Credit Hours
This course explores the role of fast food in our society. Fast food is something we take for granted, yet it has helped shape our culture as well as our economy and is a key symbol of the American lifestyle to the rest of the world. In this course we will examine the history of the fast food industry, the nature of work in the fast food sector, the global reach of corporations like McDonald's and Starbucks, the environmental impact of food production, and the rise of the "slow food" movement. The course will introduce students to perspectives from the social and behavioral sciences including economics, sociology, anthropology, environmental studies, science and technology studies, politics, and history. (F)
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

LIBS 117  The Conscious Brain  3 Credit Hours
This course will use visual perception and its organization in the brain and related phenomena such as attention and memory as tools to explore the issue of where in the brain consciousness is located, and what the necessary and sufficient criteria for consciousness are. A central premise is that consciousness, formerly the sole province of philosophers, can now be studied empirically using scientific methodologies. (F)
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

LIBS 118  Gender & Relationships  3 Credit Hours
This course will focus on gender and close relationships. We will examine how pop culture (including popular movies and self-help psychology books) tend to construct gender as a naturally occurring dichotomy, emphasizing the "vast" differences between women and men. For example, John Gray's relationship self-help book titled "Men are from Mars, Women are from Venus" has sold millions of copies and has helped to perpetuate the idea that women and men are so different as to be considered different species. The course will introduce students to perspectives from various disciplines including psychology, sociology, communications and gender studies. Using theory and scientific research from these various disciplines, students will learn to critically examine the ways that gender and close relationships are portrayed in our society.
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman
**LIBS 119: Culture Wars** 3 Credit Hours
This course explores the aspects of the conflict between religion and science in America using the Scopes Trial of 1925 as the primary case study. The trial centered on the teaching of certain ideas generally thought to be part of Charles Darwin's theory of evolution via natural selection. These claims will be evaluated by examining the science of Darwin's "On the Origin of Species". The political debate will be examined first in the context of Thomas Jefferson's writings on democratic policy and science, and then from the perspective of early populist and fundamentalist reaction to Darwinism. The subsequent development of Darwinism patterns in American social, ethical, and literary thought will also be explored, as will the rise of the modern creationist movement. The course will conclude with an analysis of the political, educational, and scientific response to that movement.

Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

**LIBS 120: World War II and the Cinema** 3 Credit Hours
This course seeks to explore how the Second World War has been depicted to American audiences during the previous half century. It focuses on ten major films. The first half of the course examines a series of themes uppermost in the minds of directors during the conflict; the second half of the course will explore how the legacy of the war has been remembered during the previous half century.

Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

**LIBS 121: East Meets West: Global Conn** 3 Credit Hours
This seminar will introduce students to the following: (1) key primary sources for China and East Asia that focus on global interconnections and exchanges; (2) key theoretical issues tied to thinking about global interconnections; and (3) suggested further readings in secondary sources. Upon completion, students will be familiar with some of the basic ways to think and to find out about exchanges and interactions in world history, and to incorporate Chinese and East Asian materials (in translation) into their research.

Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

**LIBS 122: Writing about College Life** 3 Credit Hours
In this class we will look at how our own experiences conform to or challenge popular myths and narratives about the historical and contemporary college experience in America. We will study how college life is constructed in novels, newspapers, diaries, letters, personal interviews, essays, textbooks and films. While reading and writing about the college experience, we will address the intersection between fact and fiction and explore how print and visual representations might shape our perceptions of our world. Overall, students' own stories as college students will be crucial to the class's investigation, assessment and production of college life narratives.

Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

**LIBS 123: Cognitive Science Fiction** 3 Credit Hours
What does it mean to be human? Can machines fall in love? Can our consciousness be transmitted to another human being or substance? Is language fundamental to communication of thought? If so how would communication with other life forms proceed? These questions have traditionally been the domain of science fiction. However, given advances in technology, scientists are asking these questions with increasing frequency. This course explores the interplay between science and fiction. Each week we will examine a particular question through both science and fiction (book, film, etc) and see to what extent the science coincides with, or deviates from, the fiction. There will be a heavy emphasis on topics in cognitive science - an interdisciplinary science of mind and intelligence encompassing fields such as cognitive psychology, philosophy, linguistics, neuroscience and artificial intelligence.

Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

**LIBS 124: Wireless World** 3 Credit Hours
An examination of the impact of current Internet-based services on such fields as journalism, publishing and research. By critically examining such phenomena as blogs, social networking systems (MySpace and Facebook), and Wikipedia, students will develop critical literacy and become more effective readers, writers and researchers.

Corequisite(s): COMP 105

**LIBS 125: Apathy 2 Action: Amer Citznshp** 3 Credit Hours
An examination of American citizenship as understood and practices in a variety of arenas of public life. We will examine both historical and contemporary perspectives on citizenship, including the ways in which public discourse helps situate Americans? understanding of the idea of citizenship, and by extension, the practice of democracy. In addition to exploring citizenship as it operates in the political arena and civil society, we will emphasize the role of higher education in nurturing active citizenship. This seminar includes an academic service learning requirement. Academic service learning is an educational method that integrates volunteer community service with course material to enhance the learning objectives of the course. Students will be expected to participate in a carefully-chosen and instructor-approved civic activity (e.g., volunteerism, democratic participation, public advocacy) that will highlight different models of citizenship in practice.

Corequisite(s): COMP 105

**LIBS 126: Anthropologists on Campus** 3 Credit Hours
Anthropology professors have studied the lives of university students (My Freshman Year; Coming of Age in New Jersey). This course turns the tables, inviting new students to conduct field work on the hidden lives of professors, university staff and other students. Through guided practice in ethnographic skills-interviewing and participant-observation-students will come to understand what culture means to anthropologists while exploring the multiple cultures of UM-Dearborn and gaining insights on meanings and functions of higher education.

Corequisite(s): COMP 105

Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters
LIBS 127  Oceans of Data  3 Credit Hours
This course will pursue two distinct themes. The first is the triumphs of modern statistical methodology in science during the last hundred years. Definitive studies such as the Salk Vaccine Field Trials and those involving the smoking and lung cancer controversy will be examined in depth. The second theme is the awareness and use of public access databases, which are also used by researchers and policymakers. These include the National Health and Nutrition Examination Survey (NHANES), the Surveillance Epidemiology and End Results (SEER) database of cancer registries, the Statistical Abstract of the United States, and SearchSystems.net Public Records Directory. The course will involve a number of readings and the interpretations of data that will form the basis of classroom discussion and written reports.
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 128  Exploring Race and Identity  3 Credit Hours
This seminar will examine a variety of models of mental health in African Americans and racial and ethnic self-identity development. The impact of Black society, culture, family, racism and poverty on personality growth of African Americans will be explored. The history of Black psychology and the pioneer theorists who have made significant contributions to foundation and continuing study of the thoughts, feelings, behaviors and mental health of African Americans will be discussed.
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 129  Trauma, Text, & the City  3 Credit Hours
An exploration of how artists and writers represent urban trauma (terror, violence, destruction, absence) to describe indescribable suffering. In the wake of urban chaos, how do writers make urban community possible? To answer this question, we will examine traumatic events in New York City (9/11) as well as Detroit to understand how emails, photographs, novels, documentaries, and films try to narrate chaos and stabilize urban history. In addition to films that experiment with narrative (such as Memento [2000] and documentaries about 9/11 and Detroit), texts may include writings by psychologists (Freud), urban historians (Sugrue), cultural theorists (Baudrillard), and novelists (Joseph Conrad).
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 130  Liberal Arts & the Professions  3 Credit Hours
A liberal arts perspective on careers and professions. Topics include the historical relationship between a liberal arts education and professional training, the development of the concepts of career and profession, sociological and psychological understandings of professions and workplaces, and accounts of work in several different professions (such as journalism, teaching, and medicine). Assignments focus on enhancing the connections between academics and career preparation. Students enrolled in Libs 130 must also enroll in Exploratory Studies 102, a one-credit career-planning course that assists students in assessing their interests, skills, and values and in identifying and researching careers.
Corequisite(s): EXPS 102

LIBS 131  Understanding Global Cultures  3 Credit Hours
Globalization is the predominant interpretative concept through which we analyze the state of the planet in general, and the intermingling of cultures in particular. This course proposes a comprehensive examination of cultures around the world to first-year university students. A transdisciplinary approach (history, political science, economics, geography, and anthropology) will introduce students to a wide breadth of content and depth of contextualization, and enhance their understanding of the complexities of the (post)modern world. In addition to readings on the main groups of world cultures, we will analyze several films that address the issues of cultural identity and globalization. The question of stereotyping cultures will be discussed through examples of parodic representations of cultures. The course will also address the tensions between local ways of life (historical, linguistic, ethnic, and religious) and today's pressures for transnational and multiple identities, intensified by the communication of ideas and the movement of people around the world. Thus, we will also look at how the cultures of immigrant communities in southeast Michigan have contributed to the local cultural configuration.
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman

LIBS 132  Engaging Communities  3 Credit Hours
This course studies concepts of community and service within American culture. It traces the development of civic life in the U.S. by examining the promises and challenges of community and citizenship, especially questions of inclusion and exclusion in American civic life. Students are expected to engage in some form of active citizenship with this question in mind: What individual and collective actions are most effective in making our communities into places in which each person can thrive?
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 133  Jesus and the Gospels  3 Credit Hours
Who is Jesus of Nazareth? For centuries people seeking and answer have turned to the four gospels of the New Testament. But how reliable are these texts? Were they written as biographies, histories, or to fulfill other purposes? This course will address these and other questions associated with the quest for the historical Jesus. Students will be introduced to a variety of approaches involved in the literary-historical study of the gospels and New Testament backgrounds, and learn about the methods scholars employ to move from these texts and contexts to an historical portrait of Jesus. Attention will also turn to wide range of gospels not found in the New Testament to see what light they can shed on the Jesus’ identity.
Corequisite(s): COMP 105
Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters
LIBS 134 Nano-fiction 3 Credit Hours
Students in this seminar will explore a collection of extremely short stories—weird and wonderful stories that manage to ignite the imagination and evoke complex realities in just a few pages. Discussion of the stories, guided by provocative questions and thought experiments, will help students develop ways to navigate texts, subtexts, and contexts at a college level, to write more critically and analytically, and to read with more confidence and passion. The seminar will incorporate a series of short, focused writing assignments and some creative research projects. The goal is to discover rich worlds in tiny packages... and return safely, if somewhat altered, to the real world.

Corequisite(s): COMP 105

Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 135 Urban Monsters&Suburb Angels 3 Credit Hours
If cities are the centers of human civilization, then why have we inherited such horrific stereotypes of urban environments? This course analyzes how writers (screenwriters, dramatists, urban theorists, architects, novelists, and poets) tried to reimagine cities (both in America and Britain) as both a unified community of English-speaking individuals and a globalizing model of “civilized” social organization between 1660 and the present. In doing so, the course argues that our understanding the “monstrous” connotations of cities depends upon our imagining the simultaneous creation of morally “angelic” middle-class suburbs in both gothic and horror writing and visual art. Reading may include Dracula, Journal of a Plague Year, The Strange Case of Dr Jekyll and Mr Hyde, Linden Hills, and The Jungle.

Corequisite(s): COMP 105

Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 136 Bad Decisions 3 Credit Hours
The course is based on a recent book by Daniel Kahneman, entitled “Thinking, Fast and Slow”. The book is based on the premise that the human brain supports two different modes of thought: (a) a largely unconscious mode that is capable of processing large amounts of information quite quickly, and (b) a slower mode that operates more on the basis of logic. The goals of the course would be to (a) make sure students understand these two modes and the accompanying data and rationale that support the two modes, (b) understand and be able to apply the fairly simple methodology that underlies many of the related experiments, (c) improve one’s own thinking by learning when to rely on each of the two systems and how to avoid the pitfalls associated with each, and (d) be able to extend the literature by performing novel follow-up experiments based on those already performed.

Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 137 American Horror Stories 3 Credit Hours
This course analyzes American culture through the lens of its horror industry: in film, literature, art, and other forms of artistic and popular culture. Horror, because of its nature as an extreme form of representation and its association with the imagination rather than reality, has the ability to reveal certain truths and theories about history, culture, and ways of being that are difficult to access through other modes of expression. This course explores these truths and theories by studying American horrors in a way that contextualizes film, stories, art, and other forms of popular culture within particular social, political, and historical moments. Examples include: Cold War horror productions (the short stories of H.P. Lovecraft and Richard Matheson) and the use of aliens and other invaders as a stand in for outsiders and “others," domestic horrors like The Nightmare on Elm Street and Beloved and the ways in which violence, gender, race and the home intersect, and a study of post-feminist heroines in Buffy the Vampire Slayer and Pretty Little Liars.

Corequisite(s): COMP 105

Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 138 Wild Thing:Attitudes-Animals 3 Credit Hours
This course is an interdisciplinary study of the concepts of what it means to be human and how that compares with other animal species. By examining the various ways in which nonhuman animals are objectified in their relationship to humans through religious teachings, portrayed in the media sometimes anthropomorphically, and the ways in which humans make use of animals, students will engage in their own academic inquiry leading to in-depth class discussions about the concept of what it means to be a human and a nonhuman animal. These investigations and discussions will be based on readings and other sources to guide students’ understanding of their own and other’s attitudes to human and nonhuman animals within societies and cross-culturally.

Corequisite(s): COMP 105

Restriction(s):
Can enroll if Class is Freshman
Can enroll if College is Arts, Sciences, and Letters

LIBS 139 Crossing Boundaries 3 Credit Hours
FULL TITLE: Crossing Boundaries: Passing and Social Identity in American History Have you ever thought that life would be easier if you had been born a different person? This course examines the stories of boundary crossers: individuals who acted on that desire and ‘passed’ for a member of a different social group. People who have lived on both sides of a social identity offer a unique opportunity to understand the meaning of race, class, gender, and sexual orientation in American society. Their experiences can help us understand social categories and how they have changed over the course of history. What, for example can a person who lived as both a woman and a man tell us about the significance of gender in our society? (OC)

Restriction(s):
Can enroll if Class is Freshman or Sophomore
LIBS 140 Hispanic Fantasy and Horror 3 Credit Hours
Full Course Title: Fearing the Unknown: Horror Fantasy in Hispanic Fiction. This course is an introduction to horror fantasy in Latin America and Spain, through short stories, novellas, and films from the early 19th through early 21st centuries. Students will explore major literary and visual texts translated into English from Spanish from several countries. This is an interdisciplinary course that will also deal with topics such as racial, ethnic, gendered/sexual, cultural, and ethno-geographical diversities and differences in Latin America and Spain. This course will provide students with the basic tools for text and film analysis, and seeks to engage students in critical discussions. (OC).

LIBS 141 East/West: Art of Japan/France 3 Credit Hours
Full Course Title: East & West Interconnections: 19th c. Art in Japan & France This course focuses on visual culture and cultural exchange between the East (Japan) and the West (France) during the second half of the 19th century. This period was a time of increased international travel, international expositions, thriving private art exhibitions, and a flourishing print culture; all of these elements facilitated the rapid spread of information and images. We examine this dynamic flow of culture and ideas through the study of texts, photographs, paintings (Impressionist/Yoga/Nihonga), prints advertisements, and fashion. As this course shows, East and West embraced each other as a source of inspiration and cultural appropriation. (F)

LIBS 142 Ancient Art and Ideology 3 Credit Hours
Full Course Title: Art, Ideology, and Persuasion in the Ancient Mediterranean This course examines the visual art of persuasion in the service of ideology and political authority in the ancient Mediterranean world, focusing on specific historical case studies-the radical religious reforms of Akhenaton in Egypt, the imperial ideology of the Persian empire, the contradictory democracy of Classical Athens, the autocratic rule of Augustus in Rome, and finally, Fascist Italy of the 1930. We will investigate the visual and literary strategies deployed by various political and cultural groups to define difference, signal virtue, and garner support. We will also be reading a variety of primary sources in translation and scholarship that provide the historical and social contexts for our case studies. (F)

LIBS 180 Talk & Text 3 Credit Hours
Full Title: Talk and Text: Language Myths and Language Facts An overview of fundamental language issues. Commonly-held beliefs about speaking and writing will be critically examined by comparing and contrasting language myths and linguistic theories, placing strong emphasis on practices of researching, writing, and speaking about language issues in an academic setting. Separate modules will deal with the origin and development of language, the importance of language rules and structures, the relationship between language, society and gender issues, and mental aspects of language, including bilingualism. (OC)

Restriction(s): Can enroll if Class is Freshman

LIBS 191 Returning Adult Learners 1 Credit Hour
LIBS 191 is designed to provide returning adult students with the support, skills, and knowledge needed for academic success at the University of Michigan Dearborn. Students will discover productive learning strategies, build a supportive network of peers, and explore campus resources by examining, through selected readings and assignments, the broader social, cultural, and individual context of being a non-traditional student on a university campus.

LIBS 200 Computer Literacy 1 to 3 Credit Hours
An introductory course in computing for students who do not intend to become computer programmers or designers. The course explores the nature and origins of computing, and examines its uses and limitations in such applications as teaching/learning, buying/selling and information storage/retrieval. The social implications of the computer revolution will be examined and limited programming will be provided with a small, home computer.

LIBS 275 GIEU: Global Intercultural Exp 3 Credit Hours
Global Intercultural Experience for Undergraduates. LIBS 275 is an interdisciplinary experiential introduction to intercultural learning that prepares diverse undergraduate students from various colleges for field experience interactions, and then helps students bring these experiences back to campus in socially and academically productive ways. It is a series of concentrated seminars of orientation, debriefing, and symposium. Restriction(s): Cannot enroll if Class is Specialist or Graduate or Doctorate

LIBS 276 GIEU: Leadership 2 Credit Hours
The Global Intercultural Experience for Undergraduates (GIEU) Leadership Seminar provides leadership training and experience for exceptional students nominated by faculty from those having completed LIBS 275. In addition to participating in a group seminar, each student will be matched with a faculty mentor in preparing for and leading an upcoming GIEU field experience. These peer leaders will have two primary responsibilities: to help in team formation for the new field site; and to assist faculty members on site with logistics, peer communication, and organization. In addition to their practical experience, each participant will complete reflection exercises and essays. Restriction(s): Cannot enroll if Class is Specialist or Graduate or Doctorate

LIBS 290 Topics in Liberal Studies 1 to 3 Credit Hours
A lower-level topics course. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC)

LIBS 320 Library Research Skills 1 Credit Hour
This course is designed to teach and strengthen the information competency and research skills of college students. This course provides students with life-long learning skills needed to access, evaluate, and utilize information resources, including full-text article databases, internet resources, online catalogs, as well as materials traditionally located in the library.

LIBS 329 Jesus and the Gospels 3 Credit Hours
Full Course Title: Jesus and the Gospels: Between Fact and Fiction-Who was Jesus of Nazareth? For centuries people seeking an answer have turned to the four gospels of the New Testament. But how reliable are those texts? Were they written in biographies, histories, or to fulfill other purposes? This course will address these and other questions associated with the quest for the historical Jesus. Students will be introduced to a variety of approaches involved in the literary historical study of the gospels and New Testament backgrounds, and learn about the methods scholars employ to move from these texts and contexts to an historical portrait of Jesus.
**LIBS 330  Innovators-Project Development  3 Credit Hours**

This course is an introduction to the theory and practice of the Honors Transfer Innovators (HTI) Experience. HTI is a project-based, collaborative learning community with a focus on self-transformation, creativity, diversity, leadership, and reflection. We explore these themes through readings, small group projects, and mentorship from senior students in the 400 level course, as well as the use of educational technology, and community engagement. This course is only open to students admitted into the HTI learning community.

**Restriction(s):**
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Attribute is Honors Transfer Innovators

**LIBS 351  Critical Food Studies  3 Credit Hours**

This course is about revealing the powerful ways that food shapes our lives. Food is rapidly becoming a focal point for pedagogy and research because it lies at the nexus, and intersects multiple disciplines. It is essential to life and our health is heavily reliant upon adequate nutrition. The production and distribution of food is also deeply political and under strain from economic and social forces. This course uses a holistic approach to better investigate the complex ways that food impacts our lives and how food insecurity contributes to income, social, and political inequality in the US. (F,W,S)

**Prerequisite(s):** COMP 106 or COMP 270 or COMP 280 or COMP 220

**LIBS 364  The European Union  3 Credit Hours**

This course examines the history and politics of European integration, notably institutional development, decision-making procedures and dynamics, and policy formulation in the European Union. The course will concentrate on the intergovernmental conferences and treaty reform, the relationship between European politics at the subnational, national and supranational levels; the role of national, institutional, and non-state actors; problems of accountability and legitimacy; the economic and monetary union; and enlargement. The course will also address questions of globalization and technology, and the American perception of the EU. (OC).

**Prerequisite(s):** COMP 105

**Restriction(s):**
Can enroll if Level is Undergraduate

**LIBS 395  Co-op Education Work Assignment  1 to 3 Credit Hours**

Students are eligible to compete for job openings listed with the co-op office by employers. After application and interview, employers hire the student best suited to employer’s job needs. Study/career-related paid positions are either alternating full-time or parallel part-time. Under a cooperative work agreement the student submits academic learning objectives and evaluations to co-op faculty advisor, who, upon review of employer evaluation, determines credit for co-op learning experience. Students must fulfill the seminar and study term requirements of the program.

**LIBS 396  Adv Co-op Work Assignment  1 to 3 Credit Hours**

Students who have completed two terms of LIBS 395 may move on to LIBS 396, which offers advanced training in career-related topics, especially leadership. In addition to fulfilling the work-site terms of the placement, students are required to submit leadership goals as part of their Learning objectives and leadership assessment as part of their end of term evaluation. Oral report on how leaderships objectives fared in the workplace will be presented to members of the seminar, LIBS 300. LIBS 395 is a prerequisite for LIBS 396.

**Prerequisite(s):** LIBS 395

**LIBS 397  Adv Co-op Work Assignment II  1 to 3 Credit Hours**

Students who have completed two terms of LIBS 395 and two terms of LIBS 396 may move on to LIBS 397, in which students assess their placement in the light of research on the topic of good work. In addition to fulfilling the work-site terms of the placement, students are required to conduct informational interviews of professionals in their field, including people on the work site, with special focus on that aspect of professionalism where excellence and ethics intersect. The results of interviews will be reported in the end-of-term placement evaluation.

LIBS 395 and LIBS 396 are prerequisites for LIBS 397.

**Prerequisite(s):** LIBS 395 and LIBS 396

**LIBS 430  Innovators Capstone  3 Credit Hours**

LIBS 430 is a three-credit hour practicum based course that serves as the capstone for the Honors Transfer Innovators (HTI) Experience. Students will engage in theoretical, collaborative, and project based learning experiences focused on peer mentoring, project completion, and creative leadership. Based on these experiences, students will identify best practices that are applicable to mentoring HTI 300 level students and develop a set of principles to guide their mentoring relationship. Students in this course will mentor HTI 300 students who will be crafting their project proposals. In addition students in this course will complete an M-Portfolio documenting their HTI experience.

**Prerequisite(s):** LIBS 330

**Restriction(s):**
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Attribute is Honors Transfer Innovators

**LIBS 442  Medical Ethics  3 Credit Hours**

An examination of moral issues in medicine. Among the problems to be considered are truth-telling and paternalism in the doctor-patient relationship, psychosurgery and behavior control, death and euthanasia, the allocation of scarce resources, and genetic counseling and control. Specific attention will be given to ethical theories and to philosophical concepts such as rights, autonomy, and justice.

**Prerequisite(s):** PHIL 240

**LIBS 450  Integrative Learning  3 Credit Hours**

The value of interdisciplinary studies is the ability to cope with issues of contemporary urgency and global significance from multiple points of view. The purpose of this course is to address issues that are relevant to a student’s field of study, and that can be investigated by applying knowledge from several disciplines. Each student will compose a rationale for their programs of study; will identify issues related to their chosen programs of study; will choose research a topic or issue. The several assignments of the course build up to the completion of a research project to investigate, analyze, evaluate and attempt to provide a solution for a complex issue. (FW)

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally.
Library Science (LIBR)

LIBR 465  Literature for Children  3 Credit Hours
The evaluation of books for children aged three to twelve. Fiction, folklore, poetry, illustration, and informational books are considered with emphasis on the development of standards for selecting materials with reference to the interests, needs, and abilities of children and the enrichment of the school curriculum. Designed for librarians, supervisors, and teachers in the elementary school. Students will also carry out assignments with children and therefore must submit the following clearances as prerequisites in order to register for this class: Blood Borne Pathogen test, Criminal Background Consent, Video Recording Consent. For more information access the Field Placement Office website at https://umdearborn.edu/cehhs/cehhs_fpo/.

Prerequisite(s):
Infect Disease/Blood Born Path with a score of 1 and Criminal Background Check with a score of 1 and Video Recording Consent with a score of 1

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

LIBR 470  Literature for Young People  3 Credit Hours
Surveys and develops criteria for appropriate literature for young people in junior high school. Fiction, non-fiction, folklore, poetry and fantasy are considered with reference to the interests, needs and abilities of adolescents. Designed for librarians, supervisors, and teachers in the secondary school.

Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior

LIBR 475  Issues Lit Child/Yng People  3 Credit Hours
This course is designed to heighten the awareness and sensitivity of teachers to the treatment of issues in modern and traditional literature for elementary and middle school children. Among these issues will be justice, ethics, abuse, conformity, aging, death, sibling problems, alienation, friendship, prejudice, gender, and other areas of concern. Techniques and activities for fostering discourse and open inquiry in the classroom, relative to the literature, will be explored and presented.

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Linguistics (LING)

LING 180  Text & Talk  3 Credit Hours
An overview of fundamental language issues about which non-specialists are generally curious but often misinformed. Separate modules will deal with the origin and development of language, the importance of linguistic structures, the relationship between language and society with a focus on gender issues, and mental aspects of language, including bilingualism. Commonly-held misconceptions about speaking and writing will be critically examined by comparing and contrasting language myths and facts, placing strong emphasis on practices of reasearching, writing, and speaking about language issues in an academic setting.

LING 280  Introduction to Linguistics  3 Credit Hours
The basic concepts, scope, and methodology of the descriptive and historical study of the English language.

LING 281  Language, Thought, and Culture  3 Credit Hours
A practical application of linguistic principles to many aspects of human behavior. Some of the topics covered will be language and thought, first and second language acquisition, social dialects, and reading.

LING 375  Psychology of Language  3 Credit Hours
The nature of human language as seen from the perspective of experimental psychology. The course introduces the student to current developments in linguistic theory.

Prerequisite(s):
PSYC 171 or PSYC 170 or LING 280 or PSYC 101

LING 383  American English  2 to 3 Credit Hours
The development of American English and its dialects interpreted in the light of cultural history and processes of language change.

Prerequisite(s):
LING 280 or LING 281

LING 385  Language and Gender  3 Credit Hours
Examines theories of differences between male and female speakers of English, focusing on phonological, syntactic, semantic, stylistic, and conversational features, with analyses of differences in speaking strategies and agendas of male and female speakers, as well as split-gender language situations in the workplace, home, and social settings.

Prerequisite(s):
LING 280 or LING 281

LING 388  Language Pathologies  3 Credit Hours
A survey of language pathologies, spoken and written; production and reception; primary and secondary (those arising from other medical dysfunctions: stroke, muscular dystrophy, multiple sclerosis, cerebral palsy, cleft, deafness). Attention to pathologies related to psychoses and neurological disorders.

Prerequisite(s):
LING 280 or LING 281

LING 390  Topics in Linguistics  3 Credit Hours
Examination of problems and issues in selected areas of linguistics. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ.

LING 391  Independent Study  3 Credit Hours

LING 399  Independent Studies in Linguistics  1 to 6 Credit Hours
Readings or analytical assignments in linguistics in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. May be repeated for a maximum of 6 credit hours.

(F, W)
LING 422  Language and Popular Culture   3 Credit Hours
This course provides an overview of popular culture theories and communication models along with research methods. It offers an accessible, in-depth presentation of popular culture including music, film, television, magazines, comics, animation, and advertising in the US and the beyond. The main focus of the course is to highlight the functions of language, particularly, dialects, accents, and foreign languages, in producing and consuming local and global pop culture texts.

Restriction(s):
Can enroll if Level is Undergraduate

LING 425  Language and Society   3 Credit Hours
An examination of the social functions of speech through readings and exercises, emphasizing schools and other applied settings. Topics include ethnic and social class dialects, codeswitching, and the organization of conversation. Students cannot receive credit for both LING 425 and LING 525. (YR).

Prerequisite(s): ANTH 101 or LING 280 or LING 281

LING 461  Modern English Grammar   3 Credit Hours
The morphological and syntactic analysis of the structure of present day English considered in the light of modern linguistic science. Students cannot receive credit for both LING 461 and LING 561.

Prerequisite(s): LING 280 or LING 281 or LING 480

LING 464  Contemporary Rhetorical Theory   3 Credit Hours
An examination of contemporary rhetorical theories through study of representative practitioners and related developments in linguistics, philosophy, psychology, communication, and composition and rhetoric. Students may not receive credit for both LING 464 and LING 564.

Prerequisite(s): COMM 2015 or COMM 220 or COMM 250 or COMM 260 or COMM 280 or COMM 290 or ENGL 200 or ENGL 223 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 248 or ENGL 250

Restriction(s):
Cannot enroll if Class is Graduate

LING 465  Discourse Analysis   3 Credit Hours
An examination of the syntactic and semantic devices and structures underlying communication in written texts and oral interaction. Material to be analyzed will vary from term to term (technical reports, scholarly articles, newspaper stories) but examples will be drawn primarily from the written language. Students cannot receive credit for both LING 465 and LING 565. (OC).

Prerequisite(s): LING 280 or LING 281

Restriction(s):
Cannot enroll if Class is Graduate

LING 474  Second Lang Acquisition: Engl   3 Credit Hours
A survey of fundamental concepts and major concerns in the study of English as a Second Language (ESL). The course examines a variety of psycholinguistic and sociolinguistic issues related to second language acquisition (SLA), ranging from theoretical to pedagogical. A primary focus is on developmental patterns and cognitive processes of SLA and individual variation in ESL speakers in terms of their social motivations and learning strategies. Implications for practical concerns such as the ESL teaching profession, instructional materials and curriculum development will be addressed where relevant.

Prerequisite(s): LING 280 or LING 281 or LING 480

LING 475  Lang Diversity: Arab Amer Comm   3 Credit Hours
The study of the development, features, and significance of varieties of English in southeastern Michigan, with a focus on the Arab American community. A range of sociolinguistic approaches are explored and applied to the subject matter. Topics to be addressed include code switching, language shift and maintenance, style shifting, and the role of language in identity formation. Students cannot receive credit for both LING 475 and LING 575.

Prerequisite(s): LING 280 or LING 281 or LING 480

LING 476  Sociolinguistics   3 Credit Hours
An examination of sociolinguistic approaches to the issue of variation in language. Areas to be considered include ways of defining and constructing language, different types of language varieties, how variation is structured in language, the role of sociolinguistic variation in linguistic change, and the significance of linguistic acts of identity. (YR)

Prerequisite(s): LING 280 or LING 480

Restriction(s):
Cannot enroll if Class is Graduate

LING 477  African American English   3 Credit Hours
An examination of the structure, history and use of African-American English. Topics will include the pronunciation, grammar and vocabulary of African-American English, theories of origin, linguistic repertoire and code-switching in African-American communities, the Ebonics controversy, and the role of this variety in education and identity formation. Students cannot receive credit for both LING 477 and LING 577.

Prerequisite(s): LING 280 or LING 281 or LING 480

Restriction(s):
Cannot enroll if Class is Graduate

LING 480  Concepts in Linguistics   3 Credit Hours
An examination of foundational concepts in linguistic and sociolinguistic theory, which explores the intellectual and philosophical problems raised by these concepts. Issues covered include the metalinguistic nature of language studies, the relation of language to the communication systems of other species, the physiological basis of language, language variation, language function and instrumentality, and innate versus learned behavior. Designed for students pursuing the Endorsement in ESL Teaching. (YR)

Restriction(s):
Cannot enroll if Class is Graduate

LING 482  History of the English Lang   3 Credit Hours
A thorough grounding in the history and structure of the English language. At issue are the linguistic and ideological origins of the concept of Standard English, and the strengths and limitations of different methods of analyzing the history of the language. The course will emphasize sound change, grammatical change, and their sociolinguistic context. (YR)

Prerequisite(s): LING 280 or LING 480

Restriction(s):
Can enroll if Level is Undergraduate

LING 484  World Englishes   3 Credit Hours
A study of the origin and significance of different forms of English throughout the world. Contact with other languages, pidginization, creolization, standardization, and the formation of the three circles of English are examined. (YR)

Prerequisite(s): LING 280 or LING 480

Restriction(s):
Cannot enroll if Class is Graduate
LING 490  Topics in Linguistics   3 Credit Hours
Examination of problems and issues in selected areas of linguistics. Titles as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

LING 499  Advanced Independent Studies   1 to 3 Credit Hours
Advanced research project in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. Prerequisite(s): LING 280 or LING 480

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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Marketing (MKT)

MKT 352  Mktg Principles and Policies   3 Credit Hours
An introductory course in the marketing activities associated with the free market system. The various components and functions of the marketing activities will be discussed in an integrated framework to provide insight into the role and scope of marketing in the business environment. The components and functions include: product development, pricing, promotion, distribution, consumer behavior and target market analysis. Prerequisite(s): ECON 201 and ECON 202

Restriction(s):
Cannot enroll if Class is Freshman

MKT 360  Marketing and Society   3 Credit Hours
This course explores the social scientific theories on consumption and consumer culture as well as ethical/public policy issues related to consumption and marketing. Topics will include: economic and sociological perspectives on consumer culture; the origins of consumer tastes, trends, and fashions; the psychology of happiness and how personal well-being is influenced by wealth, consumption, and materialism; and public policy concerns related to marketing and advertising. (YR).

Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

MKT 363  Digital Consumer Srch&Mktg   3 Credit Hours
This course is dedicated exclusively to digital marketing issues. Topics include: keyword research; search engine optimization which covers (a) how to design websites and other digital assets so they are highly ranked by search engines; and (b) "off site optimization" which is establishing linking partners; and Pay per click advertising. Prerequisite(s): MKT 352

MKT 382  Understanding Customers   3 Credit Hours
Students in this course will improve their ability to understand what customers want right now, what they are going to want in the future, and how to adjust the marketing mix to build lasting relationships with consumers. To do this, students will learn more advanced models of market segmentation, targeting, and product positioning. This course utilizes concepts developed in the behavioral sciences (economics, marketing, psychology, sociology, and anthropology) and qualitative research techniques to understand and predict consumer behavior, and enhance students' ability to communicate effectively with target market segments. Prerequisite(s): MKT 352

MKT 402  Marketing Management   3 Credit Hours
A case-oriented course in which the understanding and insights of the various components and functions of marketing learned in MKT 352 are applied to practical situations. Marketing decisions will be evaluated and decided for a series of real-life cases in a number of areas including: general marketing, pricing, promotion, distribution and market research. Prerequisite(s): MKT 352

MKT 434  Sales Mgmt & Personal Selling   3 Credit Hours
The purpose of this course is to provide a general understanding of the practice of sales management. The course is designed to provide a basic framework of what sales managers actually do and how they solve problems they may encounter. Team presentations, case analyses and class discussion are used throughout the course to describe and explain the skills required of sales managers to achieve their objectives. Prerequisite(s): MKT 352

MKT 436  Business to Business Mktd   3 Credit Hours
To develop an understanding of that area of marketing that addresses the needs of the organizational customer in industry, government and institutions. The special challenges of the industrial market that confront the marketing manager and sales personnel are discussed in the course. Topics include: assessing industrial marketing opportunities, the organizational buying process, formulating industrial marketing strategy and evaluating industrial marketing strategy and performance. Prerequisite(s): MKT 352

MKT 454  Marketing Research   3 Credit Hours
To introduce marketing research concepts and techniques for collection, analysis and interpretation of data for marketing decisions. Topics include: problem definition, research design, questionnaire construction, sampling, attitude scaling, statistical analysis, presentation and evaluation of research findings. A field research project may be included. Prerequisite(s): (DS 300 or DS 301) and MKT 352

MKT 455  E-tailing and Retailing   3 Credit Hours
This course introduces students to significant issues and analysis frameworks of 21st century retailing strategy and management, including retailing over the Internet, or "E-tailing." E-tailing and retailers are challenged to enhance customer experience, customer service and customer satisfaction. The students will learn the complexities and nuances of shopper behavior, shopper demographics, and how shopper decisions are influenced by store design, store environment, store atmosphere and merchandising, in brick-and-mortar and Internet stores. The course will elevate and enhance students' readiness and advancement in retail, brand management and marketing careers. Prerequisite(s): MKT 352
**MKT 456  Advg and Sales Promotion  3 Credit Hours**
A survey of the principles of advertising and sales promotion, which examines problems related to advertising management. Topics include: the scope of the advertising business, determination of objectives, strategy formulation, creating effective advertising programs, media planning with emphasis on integrating new media into the mix, the role of dealers in promotion, establishing the advertising budget, advertising research and the social and legal aspects of advertising in society.
Prerequisite(s): MKT 352

**MKT 457  Glb Mkting&Consmt Culfre  3 Credit Hours**
To provide students with an understanding of the components of marketing in the international environment. A working knowledge of the environment and the complex inter-relationship between different components of marketing will be developed. The focus is on evolving a logical and integrated framework for international marketing decisions.
Prerequisite(s): MKT 352 and (ECON 2001 or (ECON 201 and ECON 202) or MKT 402)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

**MKT 458  Advertising  3 Credit Hours**
This course covers the principles of integrated brand advertising and promotion and digital strategies. Incorporated into this course are needed skills by both traditional and online marketing majors. Students will learn to allocate resources against a wide variety of communications and promotions vehicles, so as to effectively implement a brand strategy. We examine the current state of the business and problems related to advertising and promotion in the 21st Century. Topics include: determination of promotion objectives, strategy formulation, creating effective advertising programs, media planning, roles of client and agency, establishing the advertising budget, advertising research and the social and legal aspects of integrated brand promotion.
Prerequisite(s): MKT 352

**MKT 460  Digital Comm Strategy  3 Credit Hours**
This course is an in depth survey of the principles of digital advertising/communication and promotion. We examine the issues, particularly what is a brand today, the current state of the business and problems related to advertising and management in the 21st Century. Topics include: the scope of the digital advertising business, determination of objectives, strategy formulation, creating effective digital advertising programs, media planning, roles of client and agency, establishing the advertising budget, advertising research and the social and legal aspects. (YR)
Prerequisite(s): MKT 352 and MKT 458

**MKT 463  Digital Analytics&Content Mktg  3 Credit Hours**
This course is dedicated exclusively to digital marketing issues. Topics include: using digital analytics platforms to (a) understand the flow of traffic to your website and other digital assets, and (b) conversion design, i.e. creating websites and other digital assets that both attract visitors and effectively monetize those visits and working with web programmers, i.e. this topic provides students with basic vocabulary and concepts needed to work effectively with technical experts.
Prerequisite(s): MKT 363

**MKT 471  Entrepreneurial Marketing  3 Credit Hours**
This course applies the marketing mix: product development, pricing, promotion, and distribution to an entrepreneurial enterprise. It will explore marketing-related issues faced by entrepreneurs, such as: new product innovation, development, and testing; promoting the product with scarce resources and gaining market acceptance; raising capital, forecasting market demand, and projecting profit and loss; satisfying the many stakeholders, creating pricing strategies, and cultivating channels of distribution. This course aims to be a multidisciplinary seminar that requires students to explore a potentially profitable business idea and to develop an appropriate business plan. This interactive business laboratory will lead students from the assessment of their business idea to the definition of a detailed market research and the description of a trustable strategic planning. Finally, students will be also required to devise an accurate budget in order to give accounting consistency to the business idea describe in the first part of their business plans. Topics covered include: market analysis, strategic planning and organizational structure, cost definition and analysis, break-even point, budgeting and performance representation.
Prerequisite(s): MKT 352

**MKT 488  Seminar: Marketing  1 to 3 Credit Hours**
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of School of Management.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

**MKT 488A  Seminar: Marketing  3 Credit Hours**
TOPIC TITLE: Introduction to Entrepreneurship. This course describes the entrepreneurial process and explores issues, concepts, and procedures involved in conceiving of, planning for and creating a new business. It emphasizes the need for careful identification of products or services to be offered, specification of the target market(s) and the benefits the enterprise will provide to prospective customers, determining resource requirements, locating resource providers, and developing essential operating and administrative systems. Students will identify an actual business venture they are considering, develop a business plan, and present that plan at the end of the term.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

**MKT 498  Research: Marketing  1 to 3 Credit Hours**
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

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**Mathematics (MATH)**

**MATH 080  Introductory Algebra  3 Credit Hours**
The Developmental Mathematics sequence (MATH 080, MATH 090) is offered as a service to students who need extra preparation in mathematics. MATH 080 is for students who are likely to need two semesters of additional preparation in mathematical computation and symbol manipulation, communication, and conceptual understanding. Topics in the two-course sequence include: arithmetic readiness, real numbers and expressions, linear equations and inequalities, lines and functions, systems of linear equations, rational expressions and equations, radicals and complex numbers, quadratic equations and functions, function operations and inverses. Students are required to have Internet-ready devices available for each class meeting. Skill development takes place online and outside scheduled class meetings. The course is graded on an A, B, C, NC (not completed) basis. This course is offered for additive credit.

**Prerequisite(s):** Mathematics Placement with a score of 080

**MATH 090  Intermediate Algebra  3 or 6 Credit Hours**
The Developmental Mathematics sequence (MATH 080, MATH 090) is offered as a service to students who need extra preparation in mathematics. MATH 090 is for students who (1) have successfully completed MATH 080 or (2) are likely to require only one semester of additional preparation in mathematical computation and symbol manipulation, communication, and conceptual understanding. Topics in the two-course sequence include: arithmetic readiness, real numbers and expressions, linear equations and inequalities, lines and functions, systems of linear equations, rational expressions and equations, radicals and complex numbers, quadratic equations and functions, function operations and inverses. Students are required to have Internet-ready devices available for each class meeting. Skill development takes place online and outside scheduled class meetings. The course is graded on an A, B, C, NC (not completed) basis. This course is offered for additive credit.

**Prerequisite(s):** MATH 080 or Mathematics Placement with a score of 090

**MATH 104  College Algebra  4 Credit Hours**
Primary purpose of this course is to prepare students for success in Calculus 113. Topics include equations and inequalities, linear, quadratic, polynomial, rational, logarithmic and exponential functions along with their graphs; application of these functions, systems of linear inequalities. This course does not cover trigonometric functions and cannot be used as a prerequisite for MATH 115. Students electing this course should have at least taken two years of High School Algebra and one year of High School Geometry or MATH 090. Students cannot receive credit for both MATH 104 and MATH 105. (F, W, S)

**Prerequisite(s):** MATH 090 or Mathematics Placement with a score of 104

**MATH 105  Pre-Calculus  4 Credit Hours**
The primary purpose of this course is to prepare students to take Math 115 (Calculus I) after successfully completing MATH 104 (College Algebra). It also meets students' demand to refresh or enhance their Trigonometry knowledge. Topics to be covered include: Trigonometric Functions, Acute Angles and Right Triangles, Radian Measure and the Unit Circle, Trigonometric identities, Inverse Circular Functions and basics of Functions. (YR)

**Prerequisite(s):** MATH 104

**MATH 113  Calc I for Biology & Life Sci  4 Credit Hours**
Primary purpose of this course is to prepare students for success in Calculus. Topics include equations and inequalities; linear, quadratic, polynomial, rational, logarithmic, exponential and trigonometric functions along with their graphs; application of these functions. Students electing this course should have taken at least two years of High School Algebra and one year of High School Geometry or MATH 090. Students cannot receive credit for both MATH 104 and MATH 105. (F, W, S)

**Prerequisite(s):** MATH 090 or Mathematics Placement with a score of 105

**MATH 114  Calc II for Biology & Life Sci  4 Credit Hours**
The topics of this course include advanced methods of integration (integration by parts, partial fraction), modeling with differential equations, some elementary differential equations, matrix algebra, systems of linear equations using matrix method, introduction to probability, conditional probability, discrete and continuous random variables (exponential and normal random variables). Problems in biology, medicine and physiology are used to illustrate how computation and mathematics can improve and enhance the understanding of these problems. Students cannot receive credit for both MATH 114 and MATH 115.

**Prerequisite(s):** MATH 113 or MATH 115 or Mathematics Placement with a score of 114

**MATH 115  Calculus I  4 Credit Hours**
Functions and their graphs; limits and continuity of functions, differentiation, algebraic and trigonometric functions, applications of derivatives, definite and indefinite integrals, and applications of definite integral. This course includes computer labs. Students cannot receive credit for both MATH 113 and MATH 115. (F, W, S)

**Prerequisite(s):** MATH 105 or (MATH 104 and MATH 1045) or Mathematics Placement with a score of 115
MATH 116  Calculus II  4 Credit Hours
Transcendental functions, techniques of integration, improper integral, infinite sequences and series, Taylor’s theorem, topics in analytic geometry, polar coordinates, and parametric equations. This course includes computer labs. Students cannot receive credit for both MATH 114 and MATH 116. (F,W,S).
Prerequisite(s): MATH 115 or Mathematics Placement with a score of 116

MATH 131  Conceptual Mathematics  4 Credit Hours
The purpose of Math 131 is to develop an awareness of the use of mathematics in the world around us. Students are encouraged to understand organizational tools of mathematics, including set theory and the use of deductive logic. Areas of application may include: consumer Mathematics, Probability, Statistics, social decision making, apportionment, graph theory, and mathematical modeling. Students intending to elect this course should have taken the equivalent of one year of high school algebra and one year of high school geometry. This course is not open to mathematics concentrators. (F,W,S).

MATH 205  Calc III for Engin Students  3 Credit Hours
Vectors in the plane and space, topics from multivariable calculus including partial differentiation and multiple integration, with an emphasis on applications, and line integrals and Green’s theorem. This course includes computer labs. Students cannot receive credit for both MATH 205 and MATH 215. (F,W,S).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 215  Calculus III  4 Credit Hours
Vectors in the plane and space, vector-valued functions and curves, functions of several variables including limits, continuity, partial differentiation and the chain rule, multiple integrals and coordinate transformations, integration in vector fields, and Green’s and Stokes’ theorems. This course includes computer labs. Students cannot receive credit for both MATH 205 and MATH 215. (F,W).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 216  Intro to Diff Equations  3 Credit Hours
Prerequisite(s): MATH 116

MATH 217  Intro to Matrix Algebra  2 Credit Hours
Systems of equations, matrices, determinants, the n-dimensional real vector spaces, orthonormal basis, linear transformations, and eigenvalues and eigenvectors. Students cannot receive credit for both MATH 217 and MATH 227. (F,W,S).
Prerequisite(s): MATH 114 or MATH 116 or Mathematics Placement with a score of 215

MATH 227  Introduction to Linear Algebra  3 Credit Hours
An introduction to the theory and methods of linear algebra with matrices. Topics include: systems of linear equations, algebra of matrices, matrix factorizations, vector spaces, linear transformations, eigenvalues and eigenvectors, science and engineering applications, and computational methods. Students cannot receive credit for both MATH 227 and MATH 217. (F,W,S).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 228  Diff Eqns with Linear Algebra  4 Credit Hours
Full Title: Differential Equations with Linear Algebra This course provides an introduction to ordinary differential equations. Emphasis is placed on the development of abstract concepts and applications for first-order and linear higher-order differential equations, systems of differential equations, introductory numerical methods, matrix algebra, and Laplace transform techniques. Students cannot receive credits for both MATH 228 and MATH 216 and MATH 217 (F,W,S).
Prerequisite(s): MATH 116

MATH 276  Discrete Math Meth Comptr Engr  4 Credit Hours
An introduction to fundamental concepts of discrete mathematics for computer engineering. Topics will be chosen from: set theory, partially ordered sets, lattices, Boolean algebra, semi-groups, rings, graphical representation of algebraic systems, graphs and directed graphs. Applications in various areas of computer engineering will be discussed. (F,W,S).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 297  The Nature of Mathematics  3 Credit Hours
Mathematics will be presented in a way so that Honors Program students (including nonscience majors) can learn what makes mathematics a fascinating field of study rather than a collection of dry formulas. A few “Great Theorems” will be studied in their historical context, inter-connections between mathematics and science will be studied, and some famous personalities will be presented. Open only to students in the CASL Honors Program.

MATH 300  Math Lang Proof & Struct  3 Credit Hours
A required course for students completing a Mathematics concentration, this course is also a prerequisite for many upper-level Mathematics courses. The course focuses on developing the following: an understanding of, and facility with, the logic and syntax of mathematical statements; and ability to recognize and propose appropriate strategies and outlines for proving given statements; facility in writing mathematical proofs; a knowledge base/toolbox of foundational material including basic concepts and terminology related to naïve set theory. (F,W,S).
Prerequisite(s): MATH 217 or MATH 227

MATH 315  Applied Combinatorics  3 Credit Hours
An introduction to methods and applications of enumerative and configural combinatorics. Students study several elegant and useful techniques for counting and/or generating the elements in large and unwieldy finite sets. Students will also study topics in graph theory that are applicable to real world problems. Topics include basic counting principles, the principle of inclusion-exclusion, generating functions and recurrence relations. Topics from graph theory include graph models, paths, circuits, cycles, connectedness; additional topics include the theory and applications of planarity, coloring, directed graphs, and networks and network flows.
Prerequisite(s): (MATH 200 or MATH 300) and (MATH 227 or MATH 217)

MATH 325  Probability  3 Credit Hours
Brief overview of summary and display of data, probability concepts, discrete and continuous random variables and associated probability models, expectation, independent random variables, probability generating functions and moment generating functions, sampling distributions, the central limit theorem, the t-distribution, properties of estimators, and interval estimation. Previously taught as Mathematical Statistics I. (F).
Prerequisite(s): MATH 114 or MATH 116
MATH 331  Survey of Geometry   3 Credit Hours
A development of Euclidean geometry as a formal axiom system and an introduction to non-Euclidean geometries and to Transformational Geometry. Geometric models and the history of geometry are stressed. Development of students' geometric intuition as well as their ability to work in a formal axiom system are emphasized. (F).
Prerequisite(s): MATH 116 and (MATH 200 or MATH 300)

MATH 372  Computing with Mathematica   3 Credit Hours
The course explores a variety of topics from different areas of undergraduate mathematics including calculus, matrix algebra, number theory, geometry, and discrete mathematics. Students learn to design customized Mathematica functions to solve specific problems in these areas using the symbolic, computational, graphics and programming tools provided within Mathematica. (AY,W).
Prerequisite(s): MATH 217 or MATH 227

MATH 385  Math forElem Teachers I   3 Credit Hours
The purpose of this course and the Math 386 and Math 387 courses is to provide future teachers with foundational knowledge of mathematics they will teach. An inquiry approach is emphasized involving problem solving, problem posing, pattern seeking, reasoning, justification, representations, and communications. Topics in Math 385 include numeration, meaning of operations, the reasoning behind procedures, and the rational number system, including fractions and decimals. (F,W)
Restriction(s):
Can enroll if College is Education, Health, and Human Services

MATH 386  Math forElem Teachers II   3 Credit Hours
The purpose of this course and the Math 385 and Math 387 courses is to provide future teachers with foundational knowledge of mathematics they will teach. An inquiry approach is emphasized involving problem solving, problem posing, pattern seeking, reasoning, justification, representations, and communications. Topics in Math 386 include number theory, proportional reasoning, the geometry of two-dimensional shape and measurement, integers, and the real number system. (F,W)
Prerequisite(s): MATH 385
Restriction(s):
Can enroll if College is Education, Health, and Human Services

MATH 387  Math forElem Teachers III   3 Credit Hours
The purpose of this course and the Math 385 and Math 386 courses is to provide future teachers with foundational knowledge of mathematics they will teach. An inquiry approach is emphasized involving problem solving, problem posing, pattern seeking, reasoning, justification, representations, and communications. Topics in Math 387 include data analysis; probability; the geometry of three-dimensions including shape, spatial visualization, and measurement; geometric concepts of similarity and congruence; coordinate geometry; and transformational geometry. Algebraic reasoning is integrated throughout. (F,W)
Prerequisite(s): MATH 386
Restriction(s):
Can enroll if College is Education, Health, and Human Services

MATH 390  Topics in Mathematics   1 to 3 Credit Hours
A course designed to offer selected topics in different areas of mathematics. The specific topic or topics will be announced together with the prerequisites each term. Course may be repeated for credit when specific topics differ.

MATH 390E  Topics in Mathematics   3 Credit Hours
TOPIC TITLE: Preparation for Industrial Careers PIC Math prepares mathematical science students for industrial careers by engaging them in research problems that come directly from industry. A strong component of PIC Math involves students working as a group on a semester-long undergraduate research problem from business, industry, or government. Undergraduate research is a high impact teaching and learning practice and has been shown to improve students abilities in Problem solving. Critical thinking, Independent thinking, and Communicating.
Prerequisite(s): MATH 200 or MATH 205 or MATH 215 or MATH 216 or MATH 217 or MATH 227 or MATH 276

MATH 391  Topics in Mathematics Edu   1 to 3 Credit Hours
A course designed to offer selected topics in mathematics related to K-12 education. The specific topic or topics will be announced together with the prerequisites each term. Course may be repeated for credit when specific topics differ. (OC).

MATH 391B  Topics in Mathematics and Stat   1 to 3 Credit Hours
Topic: Number and Proportional Reasoning in Middle School Mathematics Teachers. This course is designed to deepen the teachers of middle school mathematics understanding of the rational number system and its extension to the real number system in a way that models appropriate pedagogy and raises curriculum issues relevant to teaching number concepts for conceptual understanding and computation fluency. A particular emphasis will be on understanding and applying concepts of proportional reasoning. Topics related to this emphasis include analyzing connections between fraction concepts and ratios and proportions; describing the relationship between proportions and direct and indirect variation; analyzing and applying the connections between proportions and similar figures, probability and sampling; and modeling and solving problems involving rations and proportions. Other major topics include analyzing number theoretic concepts such as prime numbers and divisibility; and comparing and contrasting models of operations across number systems. Calculator and computer technology will be used as problem solving tools and for support in conceptual understanding. Curriculum resources and materials that support conceptual understanding are considered.

MATH 395  Elementary Number Theory   3 Credit Hours
Properties of the integers, the division algorithm, Euclid's algorithm, Fermat's theorems, unique factorization of integers into primes, congruences, arithmetic functions, Diophantine equations, continued fractions, quadratic reciprocity. (W).
Prerequisite(s): MATH 205 or MATH 215

MATH 396  Introduction to Cryptography   3 Credit Hours
This course discusses ways of encrypting information, a function which is vital to economics, defense and the empowerment of society. It is more crucial now than ever before to be able to securely transfer information in this age of electronic communication. After discussing primitive ways of encrypting information and explaining the need for more sophisticated encoding methods, this course explores the mathematics (number theory, finite fields and probability) behind both historic and more recent cryptosystems that have been developed for the secure transmission of data along non secure channels. This course continues with symmetric and public key cryptosystems, elliptic curves, digital signatures, zero knowledge protocols and other more advanced methods. This course does not assume any prior knowledge of number theory or probability. (YR)
Prerequisite(s): MATH 205 or MATH 215 or MATH 216 or MATH 217 or MATH 227 or MATH 228 or MATH 276

MATH 396A  Introduction to Cryptography   1 to 3 Credit Hours
The course explores ways of encrypting information, a function which is vital to economics, defense and the empowerment of society. It is more crucial now than ever before to be able to securely transfer information in this age of electronic communication. After discussing primitive ways of encrypting information and explaining the need for more sophisticated encoding methods, this course explores the mathematics (number theory, finite fields and probability) behind both historic and more recent cryptosystems that have been developed for the secure transmission of data along non secure channels. This course continues with symmetric and public key cryptosystems, elliptic curves, digital signatures, zero knowledge protocols and other more advanced methods. This course does not assume any prior knowledge of number theory or probability. (YR)
Prerequisite(s): MATH 205 or MATH 215 or MATH 216 or MATH 217 or MATH 227 or MATH 228 or MATH 276

MATH 396E  Topics in Mathematics   3 Credit Hours
TOPIC TITLE: Preparation for Industrial Careers PIC Math prepares mathematical science students for industrial careers by engaging them in research problems that come directly from industry. A strong component of PIC Math involves students working as a group on a semester-long undergraduate research problem from business, industry, or government. Undergraduate research is a high impact teaching and learning practice and has been shown to improve students abilities in Problem solving. Critical thinking, Independent thinking, and Communicating.
Prerequisite(s): MATH 200 or MATH 205 or MATH 215 or MATH 216 or MATH 217 or MATH 227 or MATH 276
MATH 399  Independent Studies in Math  1 to 3 Credit Hours
Independent study in mathematics for topics at the junior level. Topics and objectives chosen by agreement between student and instructor.

MATH 4000  Capstone in Mathematics  3 Credit Hours
Math 4000 is the Capstone course in Mathematics, covering an advanced topic in Mathematics determined by the instructor. Topics may include, but are not limited to, algebraic geometry, functional analysis, functions of several complex variables, and aspects of the study of numerical analysis, partial differential equations, combinatorics, probability, number theory, or topology. Students are expected to complete a research project in the area of the particular topic. (F, W)
Prerequisite(s): MATH 217 or MATH 227
Restriction(s):
Can enroll if Class is Junior or Senior

MATH 404  Dynamical Systems  3 Credit Hours
The aim of this course is to survey the standard types of differential equations. This includes systems of differential equations, and partial differential equations, including for each type, a discussion of the basic theory, examples of applications, and classical techniques of solutions with remarks about their numerical aspects. Also included are autonomous and periodic solutions, phase space, stability, perturbation techniques and Method of Liapunov. Students cannot receive credit for both MATH 404 and MATH 504. (AY)
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227

MATH 405  Integral Equations  3 Credit Hours
Origin and classification of integral equations, connections with differential equations, integral equations of convolution type, method of successive approximations, single kernels, elements of Hilbert space, linear operators, resolvents, Fredholm theory and Hilbert-Schmidt theory. Students cannot receive credit for both MATH 405 and MATH 505. (OC)
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)

MATH 412  First Course in Modern Algebra  3 Credit Hours
Introduction to groups, subgroups, group homomorphisms, factor groups, simple groups, cyclic groups. Sylow theorems, rings, ideals, integral domains, fields, polynomial rings, Kronecker's theorem, also properties of the integer, rational, real, and complex numbers. Students cannot receive credit for both MATH 412 and MATH 512. (W)
Prerequisite(s): (MATH 200 or MATH 300) and (MATH 217 or MATH 227 or MATH 228)

MATH 413  Linear Algebra  3 Credit Hours
Vector spaces, linear transformations and matrices, determinants, inner product spaces, bilinear and quadratic forms, Hamilton-Cayley theorem, eigenvalues and eigenvectors, and spectral theorem. Students cannot receive credit for both MATH 413 and MATH 513. (F)
Prerequisite(s): (MATH 200 or MATH 300) and MATH 216 and (MATH 217 or MATH 227)

MATH 420  Stochastic Processes  3 Credit Hours
Review of distribution theory. Introduction to stochastic processes, Markov chains and Markov processes, counting, and Poisson and Gaussian processes. Applications to queueing theory. Students cannot receive credit for both MATH 420 and MATH 520. (AY,W).
Prerequisite(s): MATH 217 or MATH 227

MATH 425  Mathematical Statistics  3 Credit Hours
Interval estimation and pivotal quantities, maximum likelihood estimation, hypothesis tests, linear models and analysis of variance, bivariate normal distribution, regression and correlation analysis, and nonparametric methods. Students cannot receive credit for both MATH 425 and MATH 525. Previously taught as Mathematical Statistics II. (AYS).
Prerequisite(s): MATH 325

MATH 435  Mathematics of Finance  3 Credit Hours
Full Course Title: Introduction to Mathematics of Finance This course teaches students to apply mathematical skills in finance. Topics covered include different types of interests, cash flows, present and future values, yield, probability, annuities, debts, stocks and bonds. (YR)
Prerequisite(s): MATH 325

MATH 442  Geometry for Teachers  3 Credit Hours
Properties of two and three-dimensional figures are covered, including congruence, symmetry, transformation, and measurement. Trigonometry from a geometric perspective and the use of trigonometry in problem solving are included. Topics also include coordinate geometry and visualization as well as the nature of axiomatic reasoning and the role it has played in the development of mathematics. An investigative approach involving problem solving, reasoning and proof, connections, and communication will be emphasized. Calculator and computer technology will support the investigation of these topics. Classroom resources and materials are considered. Different levels of geometric thinking will be explored. No credit for CASL concentration, minor, or area of focus. Open only to certified teachers or elementary education students. Student cannot receive credit for both MATH 442 and MATH 542.
Prerequisite(s): MATH 387
Restriction(s):
Cannot enroll if Level is
Can enroll if College is Education, Health, and Human Services

MATH 443  Algebra for Teachers  3 Credit Hours
Algebraic structure is emphasized, especially as it relates to arithmetic. Emphasis is on the development of algebraic reasoning and generalizations with the appropriate pedagogy. Curriculum issues relevant to teaching algebra for conceptual understanding are included. Major topics include algebraic representations of linear, exponential, power and quadratic patterns, systems of equations, and applications. An investigative approach involving problem solving, reasoning and proof, connections and communications will be emphasized. Classroom resources and materials are considered as well as calculators and computer technology as problem-solving tools to aid in algebraic thinking. No credit for CASL concentration, minor or area of focus. Students cannot receive credit for both MATH 443 and MATH 543. (F, W, S).
Prerequisite(s): MATH 386
Restriction(s):
Cannot enroll if Level is
Can enroll if College is Education, Health, and Human Services
MATH 444  Data Anlsys,Prob&Stat forTchrs  3 Credit Hours
Concepts of probability using both experimental and theoretical models are considered with an emphasis on the use of probability models to describe physical phenomena and to make and interpret predictions. Topics in data analysis and statistics include drawing inferences from visual displays of data, applying techniques of inferential statistics, sampling and simulations to generate solutions to problems, and making appropriate inferences using best fit techniques. Evaluating data and arguments to establish validity, interpreting, calculating and solving problems related to correlation, distributions, percentiles and standard scores are also included. An investigative approach involving problem solving, reasoning and proof, connections, and communication will be emphasized. Calculator and computer technology will support the investigation of these topics. No credit for CASL concentration, minor, or area of focus. Open only to certified teachers or elementary education students. Student cannot receive credit for both MATH 444 and MATH 544.
Prerequisite(s): MATH 387
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if College is Education, Health, and Human Services

MATH 445  Number & Prop1 Rng for Tchrs  3 Credit Hours
This course deepens previous work on rational number ideas and applications, and explores the concepts of ratio and proportion. Content includes a variety of situations involving proportions, for example, real-world problems involving ratios, rates, and percents, geometry involving similarity, algebra involving linearity, probability involving assigning a probability to an event, and trigonometry involving slope. Distinguishing proportional situations from those that are not and reasoning proportionally in appropriate situations are emphasized. The course includes problem solving, reasoning and proof, connections, communication, and multiple representations. No credit for CASL concentration, minor, or area of focus. Open only to certified teachers or elementary education students or by permission of instructor. Students cannot receive credit for both MATH 445 and MATH 545. (AY).
Prerequisite(s): MATH 442 and MATH 443
Restriction(s):
Cannot enroll if Class is

MATH 446  Discrete Math/Modeling for Tch  3 Credit Hours
This course interweaves the ideas of discrete mathematics with the approaches and strategies of mathematical modeling. It gives pre- and inservice teachers opportunities to deepen their understanding and use of mathematical models based on the concepts of discrete mathematics. Topics include recurrence, induction, permutations, combinations, binomial distributions, circuits, critical paths, minimal spanning trees, adjacency matrices, algorithm design and optimization. Systems thinking and multiple representations are emphasized. No credit for CASL concentration, minor, or area of focus. Open only to certified teachers or elementary education students. Students cannot receive credit for both MATH 446 and 546. (AY).
Prerequisite(s): MATH 442 and MATH 443
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is

MATH 447  Micro in Math for Teachers  2 Credit Hours
Use of the microcomputer in the mathematics classroom with an emphasis on the LOGO programming language. Problem solving, hands-on activities, and a cooperative learning environment are emphasized. Students cannot receive credit for both MATH 447 and MATH 547.
Prerequisite(s): MATH 385
Restriction(s):
Cannot enroll if Level is

MATH 449  Concepts of Calc for Teachers  3 Credit Hours
Concepts of Calculus for Teachers focuses on calculus concepts appropriate for middle school mathematics teachers and teacher candidates. The course provides a deep understanding of the major concepts of calculus: rates of change, accumulation (net change), area, and limits. Students will experience concrete approaches to the various topics using problem solving, manipulatives and technology as appropriate, with the intent being to help the learners discover how the ideas of calculus are useful in a variety of settings. Visual, numeric and commonsense approaches are used. No credit for CASL concentration, minor, or area of focus. Open only to certified teachers or elementary education students. Students cannot receive credit for both MATH 449 and 549. (AY)
Prerequisite(s): MATH 442 and MATH 443
Restriction(s):
Cannot enroll if Class is

MATH 451  Advanced Calculus I  3 Credit Hours
Properties of the real number system; point set theory for the real line including the Bolzano-Weierstrass theorem; sequences, functions of one variable: limits and continuity, differentiability, Riemann integrability. Students cannot receive credit for both MATH 451 and MATH 551. (F).
Prerequisite(s): (MATH 300 or MATH 200) and (MATH 216 or MATH 217 or MATH 228) and MATH 227

MATH 452  Advanced Calculus II  3 Credit Hours
Includes the rigorous study of functions of two and more variables, partial differentiation and multiple integration. Special topics include: Taylor Series, Implicit Function Theorem, Weierstrass Approximation Theorem, Arzela-Ascoli Theorem. Students cannot receive credit for both MATH 452 and MATH 552. (AY, W).
Prerequisite(s): MATH 451

MATH 454  Fourier and Boundary  3 Credit Hours
Fourier series and integrals. Their use in solving boundary value problems of mathematical physics by the method of separation of variables. Sturm-Liouville theory and generalized Fourier series, including those involving Bessel functions and Legendre polynomials, with applications. Students cannot receive credit for both MATH 454 and MATH 554. (F).
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227

MATH 455  Func of a Complex Var with App  3 Credit Hours
Complex number system. Functions of a complex variable, their derivatives and integrals. Taylor and Laurent series expansions. Residue theory and applications, elementary functions, conformal mapping, and applications to physical problems. Students cannot receive credit for both MATH 455 and MATH 555. (W).
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227
Restriction(s):
Can enroll if Level is Undergraduate
MATH 458 Introduction to Wavelets 3 Credit Hours
This course will introduce the students to theory and application of wavelets using linear algebra. Topics will include the discrete Fourier transform, the fast Fourier transform, linear transformations, orthogonal decomposition, discrete wavelet analysis, the filter bank, Haar Wavelet family, Daubechies's Wavelet family, and applications. Students cannot receive credit for both MATH 458 and MATH 558. (OC)
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

MATH 462 Mathematical Modeling 3 Credit Hours
The processes of constructing, implementing, and evaluating mathematical models of "real world" phenomena are investigated. Models involving continuous and discrete mathematical constructs are considered. Deterministic and stochastic models are compared. Examples are taken from genetics, epidemiology, queueing theory, and other fields. Students cannot receive credit for both MATH 462 and MATH 562. (F).
Prerequisite(s): MATH 217 or MATH 227

MATH 472 Intro to Numerical Analysis 3 Credit Hours
Solution of linear systems by Gaussian elimination, solution of non-linear equations by iterative methods, numerical solution of ordinary differential equations, data fitting with spline functions, numerical integration, optimization. Students cannot receive credit for both MATH 472 and MATH 572. (F).
Prerequisite(s): MATH 217 or MATH 227

MATH 473 Matrix Computation 3 Credit Hours
A study of the most effective methods for finding the numerical solution of problems which can be expressed in terms of matrices, including simultaneous linear equations, orthogonal projections and least squares, eigenvalues and eigenvectors, positive definite matrices, and difference and differential equations. Students cannot receive credit for both MATH 473 and MATH 573. (AY, W).
Prerequisite(s): MATH 217 or MATH 227

MATH 480 History of Mathematics 3 Credit Hours
A unified view of the rise of mathematics from ancient times to the present, as seen in its conceptual developments and developers, its major themes and its applications (including computers). Students cannot receive credit for both MATH 480 and MATH 580. (OC).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)

MATH 486 Sec School Math for Teachers 3 Credit Hours
Basic concepts, relationships, generalizations, and applications from the secondary school mathematics curriculum are discussed both from an advanced viewpoint and from the standpoint of the learner. Included are the roles of technology, problem solving, and current thinking on the teaching of secondary mathematics topics. Students cannot receive credit for both MATH 486 and MATH 586. (F).
Prerequisite(s): MATH 217 or MATH 227

MATH 492 Introduction to Topology 3 Credit Hours
Metric spaces, topological spaces, continuous maps, connectedness, compactness, separation axioms. Students cannot receive credit for both MATH 492 and MATH 592. (AY,W).
Prerequisite(s): MATH 451

MATH 499 Independent Studies in Math 1 to 3 Credit Hours
Independent study in mathematics for topics at the senior level. Topics and objectives chosen by agreement between student and instructor. (OC).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Mechanical Engineering (ME)

ME 230 Thermodynamics 4 Credit Hours
The course is a general introduction to thermodynamics with emphasis on engineering applications. Properties of pure substances. Work and heat. The first and second laws of thermodynamics. Entropy and efficiency. Applications to systems and control volumes. Mixtures of gases and vapors, air conditioning. Introduction to cycles. This course will become the first in a two-course series for mechanical engineering students, and will also be elected as a terminal course by IMSE students. Four hours lecture.
Prerequisite(s): PHYS 150 and (MATH 116 or Mathematics Placement with a score of 215) and (CHEM 134 or CHEM 144)
Corequisite(s): ME 230R
Restriction(s):
Can enroll if Major is Electrical Engineering, Manufacturing Engineering, Industrial & Systems Engin, Mechanical Engineering, Bioengineering, Engineering

ME 230R Thermodynamics 0 Credit Hours
Recitation component for ME 230. Must be taken concurrently with ME 230.
Corequisite(s): ME 230

ME 260 Design Stress Analysis 4 Credit Hours
An introduction to statics and stress analyses with emphasis on both mechanics fundamentals and design applications. (FWS).
Prerequisite(s): PHYS 150 and (ENGR 250* or ECE 385*) and (MATH 205* or Mathematics Placement with a score of 215 or MATH 215*)
Corequisite(s): ME 260R
Restriction(s):
Can enroll if College is Engineering and Computer Science

ME 260R Design Stress Analysis 0 Credit Hours
Recitation component of ME 260. Must be taken concurrently with ME 260.
Corequisite(s): ME 260

ME 265 Applied Mechanics 4 Credit Hours
A comprehensive introduction to the science of applied mechanics, encompassing a study of forces and the stresses, deflections, and motions which they produce. Topics include the concept of equilibrium and static force analysis; the mechanics of deformable bodies (internal stresses, constitutive relationships, strains, deflections, failure); statics of indeterminate systems; kinematics; kinetics of particles, systems of particles, and rigid bodies. Four hours lecture. This course is not open to ME majors (F, S, W).
Prerequisite(s): PHYS 150 and (MATH 205* or Mathematics Placement with a score of 215 or MATH 215*)
Restriction(s):
Cannot enroll if Major is Mechanical Engineering.

ME 290 Spec Topics in Mech Engin 1 to 3 Credit Hours
Special topics in mechanical engineering selected according to students’ interest and availability of instructors and equipment.
ME 299  Internship/ Co-op  1 Credit Hour
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ME 325  Thermal Fluid Sciences I  4 Credit Hours
Prerequisite(s): ENGR 216 and ME 230 and ME 260
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

ME 345  Engineering Dynamics  4 Credit Hours
A comprehensive treatment of statics and the kinematics and kinetics of particles, systems of particles, and rigid bodies from a Newtonian viewpoint utilizing rigorous vector techniques. The time-dependent description of kinematical quantities and of dynamic forces and moments. Matrix methods and digital computer techniques.
Prerequisite(s): (ENGR 216 or ME 215) and ME 260 and MATH 216

ME 349  Instrument & Measurement Systems  3 Credit Hours
Modern instrumentation systems are considered beginning with generic issues such as calibration, error analysis, and dynamic response characteristics of instrumentation. Specific transducer systems (temperature, force and pressure, etc.) are presented, as well as interfacing techniques and elementary signal processing. Microprocessors are introduced for use in measurement and control applications. (F,W,S).
Prerequisite(s): (ME 265 or ME 345) and ECE 305
Corequisite(s): ME 349L
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ME 349L

ME 360  Des and Analy of Mach Elem  4 Credit Hours
Application of fundamental mechanics to analysis and design of elementary mechanical components and systems. Topics include: stress and strain analysis; experimental measurement; stress concentration; failure theories; safety factor; fatigue; fracture; combined loading; impact; buckling; energy methods. Components considered: fasteners; springs; bearings; gears; beams; shafts and other power transmission components. Numerical techniques. (F,W,S).
Prerequisite(s): (ENGR 216 or ME 215) and ME 260
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Major is , Mechanical Engineering, Bioengineering

ME 364  Prob, Stats, and Rel in Mach D  3 Credit Hours
Introduction to planned experiments in machine design and mechanical metallurgy with emphasis on orthogonal test programs with small blocks. Classical statistical analyses (e.g., analysis of variance for randomized complete block and split-plot designs) as well as computer intensive analyses (e.g., permutation and randomization tests). Maximum likelihood analysis for censored and uncensored life data and for strength (quantal response) data. Systems reliability in machine design.
Prerequisite(s): (MATH 217 or MATH 227) and ME 260 and ENGR 216

ME 371  Heat Transfer  3 Credit Hours
Prerequisite(s): ME 320 and ECE 305*

ME 375  Thermal Fluid Sciences II  4 Credit Hours
Prerequisite(s): (ME 325 or ME 320) and ECE 305*
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

ME 379  Thermal-Fluids Laboratory  3 Credit Hours
An experimental investigation of thermodynamic, fluid mechanic, and heat transfer principles. Students will learn about thermal-fluids instrumentation and conduct experiments. In addition, they will design their own experiments to demonstrate their understanding of the principles. (F,W,S).
Prerequisite(s): (ME 320 or ME 325 or ME 3251 or ME 3252) and (ME 349 and BENG 351) and (ME 371* or ME 375*) and (COMP 270 or COMP 106 or Composition Placement Score with a score of 40 or COMP 220)

ME 381  Manufacturing Processes I  4 Credit Hours
This course introduces the students to the fundamentals and principles of manufacturing processes for engineering materials. It seeks to transfer an understanding of the application of principles of engineering materials and their influence on manufacturing processes. Topics covered include structure and manufacturing properties of metals, casting, heat treatments, bulk deformation processes, sheet metal working processes, processing of polymers and composites, surfaces and coating, powder metallurgy, machining and joining. Case studies of design for manufacturing and measurement of product quality; economical aspects and cost considerations in manufacturing systems will be studied. Three lecture hours and three laboratory hours.
Prerequisite(s): (ME 260 or ME 265) and ENGR 250
Corequisite(s): ME 381L

ME 399  Internship/ Co-op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ME 410  Finite Element Method with Appl  3 Credit Hours
A presentation of the basic concepts and fundamentals of the Finite Element Method of Analysis in general, followed by applications to both continuum and field problems. Selected areas of application: dynamics and vibration including wave propagation; acoustics; fluid mechanics including film lubrication and ground water flow; heat transfer; elasticity and stress/strain analysis including structures; electrical field problems including electrostatics and electromagnetics (F,W,S).
Prerequisite(s): (ME 345 and (ME 360 or ME 3601) and ME 375*) or (BENG 370 and BENG 325*)
ME 4191  Structural Mech & Design  4 Credit Hours  
A presentation of the methods of plane elasticity to solve a variety of problems arising in the analysis and design of structures. Review of the concepts of plane stress and strain, basic equations of plane elasticity and problems, energy methods approximate/numerical techniques, elastic-plastic bending and torsion, instability of columns and frames. (F,W,S). 
Prerequisite(s): ME 345 and (ME 3601 or ME 360)  
Restriction(s):  
Can enroll if Class is Junior or Senior  
Can enroll if Level is Undergraduate  
Can enroll if College is Engineering and Computer Science  

ME 4201  Design of Turbomachinery  4 Credit Hours 
Principles of turbomachinery design and practices. Euler’s equation for energy transfer calculations. Two- and three-dimensional velocity diagrams. Characteristic curves of axial and radial flow compressors. Design procedures of fans and blowers. Basic design and selection of pumps. Student is required to conduct a turbomachinery design project by applying the theory learned from the course. (W). 
Prerequisite(s): ME 325 or ME 320  
Restriction(s):  
Can enroll if Class is Junior or Senior  
Can enroll if Level is Undergraduate  
Can enroll if College is Engineering and Computer Science  

ME 4202  Design Turbo. and Wind Gen.  4 Credit Hours 
Principles of turbomachinery design and practices with emphasis on wind power generation. Euler’s equation for energy transfer calculations. Two- and three-dimensional velocity diagrams. Aerodynamics of wind turbines. Wind turbine design and control. Power generation of wind turbines, wind energy system economics and environmental impacts. Design procedures and characteristics of compressors, fans and blowers. Basic design calculations and selection of pumps. A turbomachinery design project by using the theory learned from the course may be required. 
Prerequisite(s): ME 375  
Restriction(s):  
Cannot enroll if Class is Freshman  
Can enroll if College is Engineering and Computer Science  

ME 431  Design of HVAC Systems  4 Credit Hours  
A comprehensive treatment of the design principles and practices in the heating, ventilating, and air conditioning. Psychrometrics, design loads, distribution systems, equipment selection. 
Prerequisite(s): (ME 325 or ME 320 or ME 3251 or ME 3252) and (ME 375* or ME 371*)  
Restriction(s):  
Can enroll if Class is Junior or Senior  
Can enroll if Level is Undergraduate  
Can enroll if College is Engineering and Computer Science  

ME 440  Intro to Mechanical Vibrations  3 Credit Hours 
This introductory course on mechanical vibrations covers theories with applications, which include free and forced vibration analysis of damped and undamped, discrete (ranging from single to multi-degree-of-freedom), and simple continuous structures (such as strings, shafts, and beams), and design of vibration absorbers. Students may not receive credit for both ME 440 and ME 4461. (YR)  
Prerequisite(s): ME 345 and ME 349  
Restriction(s):  
Can enroll if Major is Mechanical Engineering, Manufacturing Engineering, Bioengineering  

ME 442  Control Syst Anly and Design  4 Credit Hours 
Prerequisite(s): ECE 305 and ME 345  
Corequisite(s): ME 442L  

ME 445  Sound and Noise Controls  4 Credit Hours  
Full Course Title: Introduction to Sound and Noise Controls This course covers basic topics in sound theory, applications, and noise control system design. Topics include sound generation, radiation and transmission, human hearing system mechanism, sound quality metrics, design of silencers, mufflers and resonator, audio system and speaker design, building acoustics, acoustical material properties and material testing, sound measurement, and Octave band analysis. The student is required to conduct a course project related to noise control system design. Students may not receive credit for both ME 445 and ME 4461. (YR)  
Prerequisite(s): (ME 265 and BENG 351) or (ME 345 and ME 349)  
Restriction(s):  
Can enroll if Major is Mechanical Engineering, Manufacturing Engineering, Bioengineering  

ME 440  Intro to Mechanical Vibrations  3 Credit Hours 
This introductory course on mechanical vibrations covers theories with applications, which include free and forced vibration analysis of damped and undamped, discrete (ranging from single to multi-degree-of-freedom), and simple continuous structures (such as strings, shafts, and beams), and design of vibration absorbers. Students may not receive credit for both ME 440 and ME 4461. (YR)  
Prerequisite(s): ME 345 and ME 349  
Restriction(s):  
Can enroll if Major is Mechanical Engineering, Manufacturing Engineering, Bioengineering  

ME 445  Sound and Noise Controls  4 Credit Hours  
Full Course Title: Introduction to Sound and Noise Controls This course covers basic topics in sound theory, applications, and noise control system design. Topics include sound generation, radiation and transmission, human hearing system mechanism, sound quality metrics, design of silencers, mufflers and resonator, audio system and speaker design, building acoustics, acoustical material properties and material testing, sound measurement, and Octave band analysis. The student is required to conduct a course project related to noise control system design. Students may not receive credit for both ME 445 and ME 4461. (YR)  
Prerequisite(s): (ME 265 and BENG 351) or (ME 345 and ME 349)  
Restriction(s):  
Can enroll if Major is Mechanical Engineering, Manufacturing Engineering, Bioengineering
ME 4461 Mech Vibration & Noise Control 4 Credit Hours
Fundamentals of mechanical vibration and principles of noise control. Use of transducers and instruments to conduct sound and vibration measurements. Free and forced vibration in single and multiple degrees-of-freedom systems, damping, eigenvalues, eigenvectors, frequency response function, modal analysis, description of sound fields, acoustical materials and material testing, acoustics of rooms and enclosures, sound quality, and principles of noise control. Students will be required to conduct either a vibration or a noise control project. Two one-and-one-half hour lectures and one three-hour laboratory. (F).
Prerequisite(s): ME 345 and (ME 349* or ME 348*)
Corequisite(s): ME 4461L
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ME 4471 Solar Energy Sys Analy&Design 4 Credit Hours
The course introduces students to the fundamentals of solar energy conversion and solar energy systems. Principles in thermodynamics and heat transfer required to understand the solar energy use is reviewed. Design of different types of solar energy systems are explored and assessed. Issues relating to the practical implementation of solar energy will also be considered.
Prerequisite(s): ME 325 and ME 375*
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is Mechanical Engineering, Bioengineering

ME 452 Sustainable Energy & Environ 4 Credit Hours
This course introduces students to the fundamentals of energy sources and their environmental impacts. It covers a wide range of conventional and alternative energy sources, which includes renewable and presents the tools for assessing their sustainability and environmental impacts. It also reviews issues related to energy storage, transportation and distribution, and challenges and future opportunities. A course project involving design of practical plans of implementation of sustainable energy technologies will be assigned.
Prerequisite(s): ME 325 and ME 375*
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Engineering and Computer Science

ME 4521 Intro Sust Energy Systems 3 Credit Hours
The course provides an overview of energy technology from a broad perspective that encompasses technical and environmental aspects. It covers a wide range of traditional and alternative energy sources and presents assessments of their availability, sustainability, and environmental impacts as well as evaluation of their potential role in solving the global energy problem.
Prerequisite(s): ME 375
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Mechanical Engineering, Bioengineering

ME 460 Design for Manufacturing 3 Credit Hours
Design decisions based on manufacturability and process-property relationships. Design for assembly. Manufacturing tolerances and quality control methods including NDT. Design methodology used for product development.
Prerequisite(s): (ME 360 or ME 3601) and ME 381

ME 4671 Senior Design I 4 Credit Hours
A guided design project with emphasis on the decision-making process associated with establishing alternatives and evaluation procedures to synthesize designs. Students propose design projects and work in teams to produce analytical designs, conduct evaluative experiments, and construct a physical design prototype. Engineering ethics and responsibility. Written and oral presentations are required at the close of the term. (F,W,S).
Prerequisite(s): ME 345 and (ME 360 or ME 3601) and (ME 375 or ME 371) and (ME 378* or ME 379*)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Mechanical Engineering

ME 4681 ME/BENG Dual Senior Design 4 Credit Hours
Full Title: Interdisciplinary Senior Design for ME/BENG Dual Degree Students A guided interdisciplinary design project course where student teams propose design projects, design a device, system or process related to mechanical-and bio-engineering and conduct evaluative experiments and/or construct a physical prototype. Engineering ethics and responsibility. At the end of the semester, the students are required to submit written reports and give oral presentations with a demonstration of their projects. Credit can only be awarded for one of the following courses: BENG 4671, ME 4671, and ME 4681. (W)
Prerequisite(s): BENG 351 and BENG 370 and BENG 364 and ME 375 and (BENG 375 or BENG 381)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is

ME 469 Senior Design II 1 to 4 Credit Hours
Student teams develop mechanical or interdisciplinary design projects, or continue projects begun in ME 4671. Work includes mechanical engineering design, and could possibly include fabrication and testing. Projects can involve efforts by interdisciplinary teams. Written and oral presentations are required.
Prerequisite(s): ME 4671

ME 472 Prin & Appl of Mechatronic Sys 4 Credit Hours
This course provides the student with hands-on interdisciplinary experience of mechatronic systems, which integrate mechanical, electrical/electronic components with computer and microprocessors to design a high performance system. Subjects will be covered including Mechanical and Electrical Actuator Systems, Digital Transducers and Modulators, Microcomputers and Microcontrollers Interfacing Actuators using graphic programming techniques, Programmer Logic Controllers (PLC), and Modeling of Fluid Systems. Laboratories form the core of the course. They cover microprocessor controlled mechanical actuator system for motion controls, materials handling, PLC programming and fluid power systems. The labs make extensive use of Simulink®, a MATLAB® toolbox, Mikro - C and/or Arduino. Each student builds control circuits on a breadboard kit to simulate a real operation. Student will be required to perform a course design project with mechatronic application in nature.
Prerequisite(s): ME 265
Corequisite(s): ECE 460, ME 442
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if College is Engineering and Computer Science
ME 481  Manufacturing Processes II  3 Credit Hours
A study of casting, welding, plastic forming, and machining of materials; analysis of forces, energy requirements, and temperature effects; design specifications economically obtainable in terms of dimensional accuracy, surface finish, and material properties, functional characteristics of equipment. Two lectures and a laboratory.
Prerequisite(s): ME 381

ME 483  Dsgn Cons in Poly and Comp Mat  3 Credit Hours
Physical and mechanical behavior of unreinforced and reinforced (composite) polymeric materials in relation to their applications in modern technology. Emphasis is given to the design considerations with these materials in contrast to those with metallic materials. Time-dependent properties, such as creep and stress relaxation, are considered. Manufacturing methods are covered. Three lectures/recitation.
Prerequisite(s): ME 360 or ME 3601

ME 484  Manufacturing Poly Comp Matl  3 Credit Hours
This course will consider the manufacturing processes for production of plastics and composite parts. The emphasis will be on manufacturing principles that are based on rheology, polymer flow and transport phenomena. Design considerations and quality control techniques for manufacturing plastic and composite parts will also be covered.
Prerequisite(s): ME 381 or IMSE 382

ME 490  Directed Design Project  1 to 3 Credit Hours
Design project involving not only design but also analysis, fabrication and/or testing. Topics may be chosen from any of the areas of mechanical engineering. Students who have taken ME 425 and ME 464 will be encouraged to take this course. The student will submit a report on his or her project and give an oral presentation at the close of the term. (F,W,S).
Prerequisite(s): ME 360 or ME 381 or ME 425 or ME 464
Restriction(s):
Can enroll if Class is Senior or Graduate

ME 491  Directed Research Problems  1 to 3 Credit Hours
Special problems selected for laboratory or library investigation with intent of developing initiative and resourcefulness. (F, W,S).
Restriction(s):
Can enroll if Class is Senior or Graduate

ME 492  Guided Study in Mech Eng  1 to 3 Credit Hours
Individual study, design or laboratory research in a field of interest to the student. Topics may be chosen from any of the areas of mechanical engineering. The student will submit a report on his or her project at the close of the term. (F, W,S).
Restriction(s):
Can enroll if Class is Senior or Graduate

ME 493  Advanced Vehicle Energy Sys  3 Credit Hours
This course will introduce the advanced energy conversion systems in automotive vehicles and cover the fundamentals, characteristics, and design consideration of the energy systems. The topic includes using alternative fuels in internal combustion engines, advanced power train systems in hybrid, electric, and fuel cell vehicle, and exhaust energy recovery systems.
Prerequisite(s): ME 325* and ECE 305*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ME 496  Internal Combustion Engines I  2 to 3 Credit Hours
Comparison of characteristics and performance of several forms of internal combustion engines including the Otto and diesel types of engines and the several types of gas turbines; thermodynamics of cycles, combustion, ignition, fuel metering and injection, pollution from engines and modeling techniques. Lectures, theory demonstrations, and experiments.
Prerequisite(s): (ME 320 and ME 330) or ME 325

ME 498 1  Automotive Engineering  4 Credit Hours
Analysis of vehicle performance in terms of acceleration, gradability, speed, fuel economy, ride comfort, stability and safety. Engine-transmission compatibility and matching. Fundamental vehicle dynamics. Computer modeling and simulation of vehicle systems by numerical techniques. Transmission ratio and torque analysis. Design of vehicle systems such as brakes, suspensions, drive line components, steering mechanisms and other subsystems. Four hours lecture. (F,W).
Prerequisite(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Mechanical Engineering, Bioengineering

ME 499  Internship/ Co-Op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Senior or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Microbiology (MICR)

MICR 309  Introduction to Mycology  4 Credit Hours
An introduction to the biology of the fungi. Classification, structure, industrial use, gastronomic qualities, and disease-producing ability of macroscopic and microscopic forms are studied. Laboratories include microscopic and macroscopic examinations of fungi, and their growth and field studies on the occurrence and classification of edible and poisonous varieties. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 130 and BIOL 140

MICR 380  Epidemiology  3 Credit Hours
Introduces the methods for infectious disease epidemiology (occurrence and spread in population) and case studies of important disease syndromes and entities. Methods include definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness. Case-studies focus on acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria and other vector-borne diseases. This course emphasizes methods of study that would contribute to understanding disease etiology.
Prerequisite(s): BIOL 140
MICR 385 Microbiology 4 Credit Hours
The biology of microorganisms is considered through study of the properties of bacteria, fungi, algae, protozoa, and viruses. Microbial structures are discussed and correlated with their function. Aspects of cellular metabolism pertinent to microorganisms are emphasized. The interaction of microorganisms and their environment, animate and inanimate, is discussed with respect to the beneficial or harmful effects of the different microbial groups. Laboratory exercises introduce the student to basic, practical microbiological techniques and illustrate various principles of microbial life. Three hours lecture, four hours laboratory. (F.S).
Prerequisite(s): BIOL 140 and (CHEM 134* or CHEM 144*)
Corequisite(s): MICR 385L

MICR 390 Topics in Microbiology 1 to 6 Credit Hours
Current topics in microbiology will be presented through a lecture, discussion and/or laboratory format. Topics will vary, as appropriate, and may cover any area of microbiology including studies on bacteria, algae, fungi, protozoa, viruses, biotechnology, mechanisms of pathogenesis and immunology. (OC).
Prerequisite(s): BIOL 385 or MICR 385

MICR 405 Applied & Environ Microbiology 4 Credit Hours
Advanced treatment of the interplay of microorganisms and the environment. Topics will include soil and water microbiology (bacteria, archaea, fungi, algae, protozoans and viruses) and plant-microbe interactions (pathogenic and symbiotic) as well as the role of microorganisms in decomposition, nutrient cycling (carbon, nitrogen, sulfur and metal cycling), wastewater and biosolids treatment, and bioremediation. 3 hr lec, 1-4 hr lab. For graduate credit elect MICR 505.
Prerequisite(s): MICR 385 or BIOL 385
Restriction(s):
Can enroll if Class is Senior

MICR 406 Microbial Genetics 3 Credit Hours
A course that emphasizes the genetics and molecular biology of bacteria and their viruses. Topics include DNA structure and replication, recombination, DNA repair, genetic mapping, mechanisms of gene transfer, regulation of gene expression, mutagenesis, and recombinant DNA techniques. (YR, W).
Prerequisite(s): MICR 385 or BIOL 385 or BIOL 306

MICR 430 Medical Virology 3 Credit Hours
The course provides a general description of the history and nature of animal virus disease. Emphasis is placed on the pathogenesis and clinical description of specific diseases. Three hours lecture.
Prerequisite(s): MICR 385 or BIOL 385

MICR 440 Micro Genetics & Phys Lab 1 Credit Hour
This course emphasizes the use of advanced microbiological techniques for understanding the genetics and physiology of microorganisms. Experiments focus on the understanding of general microbial phenomena, such as nutrition, metabolism and biochemistry, protein and nucleic acid synthesis; energy generation, enzyme regulation, membrane transport, motility, differentiation, cellular communication and the behavior of populations.
Prerequisite(s): BIOL 385* or MICR 385* or BIOL 301* or BIOL 406* or MICR 406* or BIOL 485* or MICR 485*
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

MICR 450 Virology 4 Credit Hours
The first half of this course deals with bacterial viruses, with emphasis on classical events in this field. The second half surveys the field of animal viruses, with emphasis on recent discoveries, including replication, pathogenesis, and viral association with cancers. Three hours lecture, four hours laboratory. (AYW).
Prerequisite(s): (BIOL 385 or MICR 385) and CHEM 226

MICR 455 Immunology 4 Credit Hours
A detailed study of the field of immunology. Among the topics covered are various aspects of the immunological response, such as humoral or cell-mediated immunity, cell-cell interactions, and immunology as related to the cause and prevention of disease. Three hours lecture, four hours laboratory. (AYF).
Prerequisite(s): BIOL 385 or BIOL 301 or MICR 385

MICR 459 Pathogenic Microbiology 4 Credit Hours
An introduction to pathogenic microorganisms and mechanisms of microbial pathogenicity. Disease-causing bacteria, fungi, viruses, and protozoa are studied. Laboratories emphasize clinical approaches to isolation, identification, and treatment. Three hours lecture, four hours laboratory. (AYF).
Prerequisite(s): BIOL 385 or MICR 385

MICR 485 Physiology of Microorganisms 3 Credit Hours
An in-depth examination of the physiology of microorganisms. Areas of emphasis include the growth and nutrition of microorganisms; the development of viruses, the microbial degradation of organic compounds, the regulation of degradation reactions, and the biosynthesis of uniquely microbial compounds and secondary metabolites, such as antibiotics and toxins. Consideration is given to the natural environments of specific microorganisms. (YR, W).
Prerequisite(s): (BIOL 385 or MICR 385 or BIOL 370 or CHEM 370 or BCHM 370) and CHEM 225*

MICR 495 Off-Campus Research 1 to 3 Credit Hours
Participation in ongoing experimental research at an off-campus laboratory (or in the field). Arrangements made between the research laboratory, (director of field study), the student, and the microbiology concentration advisor. No more than 6 hours combined from MICR 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F.W.S).

MICR 497 Seminar in Microbiology 1 Credit Hour
Topics of current interest in microbiology will be presented by guest lecturers, faculty members or students. Topics chosen will vary from term to term. Can be elected up to three times. One hour seminar. Permission of instructor. (W).

MICR 498 Ind Study in Microbiology 1 to 3 Credit Hours
Library research and independent study performed under the guidance of a faculty member. Four to twelve hours readings. (F.W.S).

MICR 499 Lab in Micro Research 1 to 3 Credit Hours
Directed laboratory research performed under the guidance of a faculty member. Four to twelve hours laboratory. Permission of instructor. (F.W.S).

* An asterisk denotes that a course may be taken concurrently.
Military Science (MILS)

MILS 101 Introduction to Officership 1 Credit Hour
This course focuses on introduction to the Army and critical thinking. It introduces students to the Army and the Profession of Arms. Students will examine the Army Profession and what it means to be a professional in the U.S. Army. The overall focus is on developing basic knowledge and comprehension of the Army Leadership Requirements Model while gaining a complete understanding of the Reserve Officers’ Training Corps (ROTC) program, its purpose in the Army, and its advantages for the student. Students also learn how resiliency and fitness supports their development as an Army leader.

MILS 102 Introduction to Leadership 1 Credit Hour
This course introduces students to the personal challenges and competencies that are critical for effective leadership. Students will learn personal development of life skills such as critical thinking, time management, goal setting, and communication. Students learn the basics of the communication process and the importance for leaders to develop the essential skills to effectively communicate in the Army. Students will begin learning the basics of squad level tactics.
Prerequisite(s): MILS 101

MILS 201 Innovative Tactical Leadership 2 Credit Hours
This course focuses on leadership and decision making. The course adds depth to the students’ understanding of the Adaptability Army Learning Area. The outcomes are demonstrated through critical and creative thinking and the ability to apply Troop Leading Procedures (TLP) to apply innovative solutions to problems. The Army Profession is also stressed through leadership forums and a leadership self-assessment. Students are then required to apply their knowledge outside the classroom in a hands-on performance-oriented environment.
Prerequisite(s): MILS 102

MILS 202 Leadership in Changing Env 2 Credit Hours
This course places students in an experiential learning environment which provides participants the opportunity to ‘experience’ their learning, rather than simply being told what they are to learn. Students participate in a wide variety of group exercises designed to emphasize various professional leadership competencies and insights. These events, which range from physically challenging to mentally stimulating, are held both inside the classroom and in outdoor settings. The instructor acts as a facilitator, helps guide student processing through after action reviews of the events to facilitate student understanding of leadership principles, group dynamics, and problem solving methods. In addition to military skills, practical ‘life skills’ are emphasized. Lessons are designed to maximize student participation, inspire intellectual curiosity and introspection, as well as group interaction.

MILS 301 Leading Small Organizations 3 Credit Hours
This course focuses on training management and the warfighting functions. Students will study, practice, and apply the fundamentals of Training Management and how the Army operates through the warfighting functions. At the conclusion of this course, students will be capable of planning, preparing, and executing training for a squad conducting small unit tactics. Includes peer facilitation overseen by MSL IVs, supervised by ROTC Cadre.
Prerequisite(s): MILS 202
Restriction(s):
Can enroll if Class is Junior or Senior

MILS 302 Leading Small Orgs 2 2 Credit Hours
MSL 302 uses increasingly intense situational applying team leadership challenges to build cadet awareness and skills in leading tactical operations at the small unit level. Cadets review aspects of full spectrum operations. They also conduct military briefings and develop proficiency in the operation orders process. The focus is on exploring, evaluating, and developing skills in decision-making, persuading, and motivating team members in the contemporary operating environment (COE). MSL 302 cadets are evaluated on what they know and do as leaders as they prepare to attend the ROTC summer Leader Development Assessment Course (LDAC).

Restriction(s):
Can enroll if Class is Junior or Senior

MILS 401 Leadership & Management 4 Credit Hours
This course focuses course places significant emphasis on preparing students for a military officer's first assignment. It uses the philosophy of mission command in case studies and scenarios to prepare students to face the complex ethical demands of serving as a commissioned officer in the United States Army.
Prerequisite(s): MILS 302

MILS 402 Military Prof & Prof Ethics 2 Credit Hours
This course is designed to present a forum for discussion of Military and Leadership issues which will impact most directly on the newly commissioned officer. Its purpose is to discuss items of particular concern to the Junior officer. Much of the thrust of the seminar will come from student concerns and perceptions. It will include some outside readings. The student should also register for the 90 minute military skills laboratory which is taught once weekly.

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Frequency of Offering

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Modern & Classical Language (MCL)

MCL 103 First-Year Swedish I 3 Credit Hours
A beginning course in the Swedish language. Open only to CECS undergraduate students taking part in the College of Engineering and Computer Science's study abroad program with the Jonkoping School of Engineering in Sweden. The Course meets in Jonkoping, Sweden.

MCL 104 First-Year Swedish II 3 Credit Hours
A second course in the Swedish language. Open only to CECS undergraduate students taking part in the College of Engineering and Computer Science's study abroad program with the Jonkoping School of Engineering in Sweden. The Course meets in Jonkoping, Sweden.
MCL 105  Beginning Ancient Greek I  4 Credit Hours
Ancient Greek I is designed for students wishing to begin the study of Ancient Greek and will include a study of grammar and vocabulary with readings of simple Attic prose. Attention will also be given to the Greek roots of English words, including scientific and medical terms. No previous foreign language study is required as a prerequisite. (OC).

MCL 106  Beginning Ancient Greek II  4 Credit Hours
Ancient Greek II completes the study of Ancient Greek syntax and morphology and puts greater emphasis on reading connected passages in ancient Greek. Passages from selected classical authors, such as Homer, Sophocles, Aristophanes, and Plato will be read. MCL 105 is required as a prerequisite. (OC).

Prerequisite(s): MCL 105

MCL 111  Armenian I  4 Credit Hours
Introduction to basic construction and vocabulary of the Armenian language. Lab to be arranged. Completion of this course prepares the student for Armenian II. (OC).

MCL 112  Armenian II  4 Credit Hours
Continuation of Armenian I. Introduction to basic construction and vocabulary of the Armenian language.

Prerequisite(s): MCL 111

MCL 205  Intermediate Ancient Greek  4 Credit Hours
An intermediate language course in ancient Greek designed to increase the students' ability to read Greek with accuracy and speed and improve their skill in comprehension and translation. A wide range of reading selections of Greek prose and poetry will serve as the basis for translation, class discussion, and written assignments. Although the course includes a partial review of accidence and syntax as well as assigned translations from English to Greek, primary emphasis will be placed upon reading and translating Greek texts, whether prose (e.g., Xenophon, Herodotus, Lysias, Plato) or poetry (e.g., Euripides, Aristophanes). (OC)

Prerequisite(s): MCL 106

MCL 206  Intermediate Ancient Greek II  4 Credit Hours
MCL 206 is the second course in intermediate ancient Greek and is designed to provide knowledge and familiarity with the language and style of the Homeric epics, as well as an introduction to related topics. We will learn Homeric Greek and how it differs from Attic, read extensive selections from the Iliad or the Odyssey in Greek, and discuss Homer's works as poetic, literary, and cultural texts. The selections read will serve as the basis for translation, class discussion, and written assignments. Related topics to be presented include: the archaeological excavations of Troy, the scope of ancient epics, the Homeric Question and oral composition, and the nature of the Greek hero. (OC)

Prerequisite(s): MCL 205

MCL 233  Second-Year Swedish  3 Credit Hours

MCL 234  Second-Year Swedish II  3 Credit Hours

MCL 299  Independent Studies in MCL  1 to 3 Credit Hours
Reading or analytical assignments in Modern and Classical Languages in accordance with the needs and interests of those enrolled and agreed upon by the student, instructor and endorsed by the department chair. Also can be elected when a student is studying language as part of a study-abroad program.

MCL 325  Political Islam  3 Credit Hours
This course is designed as an introduction to the main issues and themes in the study of political Islam and Muslim Politics, providing a broad overview of the pertinent key concepts and issues. It provides a historical approach to the study of political Islam, and touches upon the nineteenth century Islamic revivalism. It also, explores diversity in contemporary Islamic thought and global Islamist movements.

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

MCL 3350  Arabic Culture in Class Texts  3 Credit Hours
This course gives students an appreciation of Arabic civilization through the study of excerpts from masterworks of the literary and intellectual Arabic heritage. It provides practice in reading pre-modern and modern classical texts from a variety of intellectual disciplines. Students may not receive credits for both MCL 3350 and ARBC 335. (W)

MCL 353  Italian Culture Civilization  3 Credit Hours
This course is an exploration of various facets of Italian culture and civilization. We will examine the major historical, political, social, economic, artistic and literary aspects of Italy, from its beginnings to the 21st century, through the close study of key persons, events and documents which shaped Italy’s culture and civilization, and promoted the many accomplishments and contributions of this country.

MCL 365  Introduction to the Qur’an  3 Credit Hours
This course is an introduction to the Qur’an. This class will cover the historical and the cultural factors in which the Quran appeared. The class will also examine some of the major themes covered in the Qur’an such as gender, science, pluralism, worldview and so forth. Also, it will cover major schools of interpretations and methodologies ranging from the literary to the scientific. The class will be conducted in English and knowledge of Arabic is desired but not required. No prerequisites. The class will consist of lectures, discussions, and movies.

MCL 381  Postwar European Cinema  3 Credit Hours
The course will concentrate on a series of films from various European countries with a focus on the socio-political issues, historical events and cultural preoccupations that have defined and also challenged European societies from WWII to the present. Zeroing in on the construction of European identities, the course will analyze and compare modes of narrating national, class, racial, sexual and social differences in different European nations. Themes such as memories of war and the Holocaust, new conflicts, class, immigration, women’s rights, gender, and East-West relations will be addressed. The course will thus privilege a cinema that offers a "récit," a story. Particular attention will be given to discourses on otherness and on the ways in which film culture has reflected, reinforced, reshaped and, in some instances, contested Europe’s past and current dominant ideologies, and identities. Readings by cultural historians and analysts will provide the context for an understanding of the films. The course will conclude with a discussion of the possible existence of a specific postwar European Cinema.

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

MCL 390  Topics in Arabic in Translation  3 Credit Hours
Examination of problems and issues in selected areas of Modern & Classical Languages. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ.
MTHY 100  Fundamentals of Music  3 Credit Hours
This course presents the fundamentals of Western music theory through practical experience, including music notation, sight-singing, and ear training. Prerequisites: none.

MTHY 101  Music Theory I  3 Credit Hours
Writing and analysis of melodic lines, alone and in counterpoint, leading to writing and analysis of harmony. Emphasis on being able to hear the sounds symbolized by notation. (F).
Prerequisite(s): MTHY 100

MTHY 102  Music Theory II  3 Credit Hours
Continuation of MTHY 101 including harmonic analysis, layer analysis, and beginning formal analysis. (W).
Prerequisite(s): MTHY 101

MTHY 390  Topics in Music Theory  3 Credit Hours
Examination of problems and issues in selected areas of music history. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specified topics differ. (OC).

MTHY 399  Independent Study Music Theory  1 to 3 Credit Hours
Readings, analytical assignments and/or compositions in music selected in accordance with the needs and interests of those enrolled and agreed upon by the instructor and the student.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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Natural Science (NSCI)

NSCI 120  Matter, Energy, and Life I  4 Credit Hours
A general science course with emphasis on basic principles and their applications. Includes basic life processes, the fundamentals of chemistry and physics, and human systems and genetics. NSCI 120 is complementary to but not a prerequisite for NSCI 121. Students cannot use both NSCI 120 and BIOL 100 to satisfy the natural sciences distribution requirements. Three hours lecture, three hours laboratory. (OC).
Corequisite(s): NSCI 120L

NSCI 121  Matter, Energy, and Life II  4 Credit Hours
A general science course with emphasis on basic principles and their applications. Includes ecology and evolution, energy and energy technology, geology and astronomy. NSCI 121 is complementary to, but may be taken independently of, NSCI 120. Three hours lecture, three hours laboratory. (F,S).
Corequisite(s): NSCI 121L

NSCI 231  Inquiry: Physical Science  3 Credit Hours
This course develops a strong conceptual understanding of physical science. Prospective K-8 teachers will participate in the same kind of inquiry-based experiences that they will use in their own teaching. Topics will include light and color, matter, and motion. (F,W,S)
Prerequisite(s): EXPS 220

NSCI 232  Inquiry: Earth/Planet Science  3 Credit Hours
This course develops a strong conceptual understanding of earth and planetary science. Prospective K-8 teachers will participate in the same kind of inquiry-based experiences that they will use in their own teaching. Topics will include geology, weather, and astronomy. (F,W,S)
Prerequisite(s): EXPS 220

NSCI 233  Inquiry: Life Science  3 Credit Hours
This course develops a strong conceptual understanding of Life Science. Prospective K-8 teachers will participate in the same kind of inquiry-based experiences that they will use in their own teaching. Topics will include characteristics of life, plants and animals, and ecology. (F,W,S)
Prerequisite(s): EXPS 220
NSCI 290  Projects in Natural Sciences  1 to 2 Credit Hours
An opportunity for non-science and lower-division science students to carry out independent projects in the natural sciences under the supervision of a faculty member. Projects range from laboratory and field observations to the development of materials and apparatus for use in laboratory exercises and classroom demonstration. In general, one credit hour corresponds to four hours of work per week. Permission of instructor. (F, W).

NSCI 295  Topics in Natural Sciences  1 to 3 Credit Hours
An introduction to the themes of the natural sciences reflecting their interactions with one another and society. Topics vary and are announced in the current time schedule. The course may be repeated no more than once under a different topic. One to three hours lecture, seminar, or field study.

NSCI 325  Gender, Science & Engineering  3 Credit Hours
Explores some of the history of women in science and engineering, the current status of women in science and engineering, and feminist theory in research. Topics include cultural influences on women in science and engineering, careers and life balance, and a feminist approach to scientific and engineering teaching and research.

NSCI 331  Phy. Sci. & Everyday Thinking  3 Credit Hours
Full Title: Physical Science and Everyday Thinking An inquiry-based physical science course suitable for prospective or practicing elementary teachers majoring or minoring in science studies. Students will construct meaningful understanding of physics and chemistry concepts through discussion, hands-on experiences and computer simulations. Specific topics will include the application of the atomic model to the behavior of gases, physical changes, and chemical changes. A learning-cycle pedagogy will be employed that consists of elicitation of initial student ideas, development of new or modified ideas, building student consensus on final ideas, and the application of ideas to new situations (F, W, S).

NSCI 332  Inquiry: Mich Earth Science  3 Credit Hours
This course develops a strong conceptual understanding of earth science as it applies to the state of Michigan. Prospective K-8 teachers will participate in the same kind of inquiry-based experiences that they will use in their own teaching. Topics will include landforms, water, weather and seasons in Michigan. This is a hybrid course with weekly meetings as well as an online component. Students who do not attend the first class meeting may be requested to drop per the instructor request drop policy. 
Prerequisite(s): NSCI 232 or GEOL 118
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if Degree is Bachelor of Science, Bachelor of Arts
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

NSCI 333  Inquiry: PBL in Life Science  3 Credit Hours
A problem-based learning course suitable for prospective or practicing elementary and middle-school teachers who major or minor in integrated science studies. This course builds on and reinforces content learned at the introductory level by applying life science concepts to complex real-world problems presented in class. Students will work in small groups to identify and research concepts and principles they need to know in order to progress through the real-world life science problems. The case studies used will require the understanding and application of concepts in cell structure and function, genetics, animal and plant physiology, and ecology.
Prerequisite(s): NSCI 233 or BIOL 130
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Sophomore or Junior or Senior
Can enroll if College is Education, Health, and Human Services or Arts, Sciences, and Letters

NSCI 390  Topics in Natural Sciences  1 to 3 Credit Hours
A course in special topics current to natural sciences. Topic and format (seminar, lecture and laboratory) for the course may vary. See current Schedule of Classes. (OC).

NSCI 390C  Topics in Natural Sciences  1 Credit Hour
Topic Title: Applied Restoration and Conservation Ecology Laboratory-This is a field based lab course that will take place in the field where students will conduct restoration, stewardship and conservation planning. Students will be exposed to and interact with professionals from a variety of organizations in southeast Michigan that are dedicated to managing and protecting the globally endangered oak-openings landscape. Some course time will be devoted to reading and discussing literature on landscape, restoration and conservation ecology. Topics and papers will emphasize local and regional ecology (lakeplain prairies, oak openings, wetlands, Great Lakes) and methods for managing, maintaining and restoring these ecological systems (e.g. fire ecology). Classroom discussion will emphasize the importance of these systems and their conservation to human health, well-being, and culture.

NSCI 490  Topics in Natural Sciences  1 to 3 Credit Hours
A course in special topics current to natural sciences. Topic and format (seminar, lecture and laboratory) may vary. See current Schedule of Classes. (OC).

NSCI 490A  Topics in Natural Science  1 Credit Hour
Topic: Workshop Science Teaching in Elementary/Middle School, This course will help you identify and correct weaknesses in your scientific knowledge so that your will be prepared to successfully complete the Michigan Teacher Test for Teacher Certification General and Integrated Science.

NSCI 497  Natural Sciences Colloquium  1 Credit Hour
A series of colloquia on selected topics representing frontier areas of current research in the natural sciences. Lectures by guest speakers invited by the department constitute a major component of the course. One hour seminar. (F).
**Operations Management (OM)**

**NSCI 498 Independent Study in NSCI  1 to 3 Credit Hours**
Provides an opportunity for students to pursue independent library-based research or readings under the direction of a faculty member. For students who wish to study an area that is interdisciplinary rather than an area focused on a single science. The student and the faculty member must complete a contract outlining the area to be studied and the product of the research.

**Restriction(s):**
Can enroll if Class is Undergraduate NCFD or Undergrad Certification only or Junior or Senior
Can enroll if College is Arts, Sciences, and Letters

**NSCI 499 Laboratory Research in NSCI  1 to 3 Credit Hours**
Provides an opportunity for students to pursue independent laboratory-based research under the direction of a faculty member. For students who wish to study an area that is interdisciplinary rather than an area focused on a specific science. The student and the faculty member must complete a contract outlining the area to be studied and the product of the research.

**Restriction(s):**
Can enroll if Class is Undergraduate NCFD or Undergrad Certification only or Junior or Senior
Can enroll if College is Arts, Sciences, and Letters

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**OM 300 Intro to Operations Management  3 Credit Hours**
Concerned with the strategic, tactical and short-term managerial issues relating to the efficient production of services and products. Examples of such issues are: manufacturing technology selection, facility location, strategic, tactical and operational planning and control and quality. (F.W.S.)

**Prerequisite(s):** MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 115

**Restriction(s):**
Cannot enroll if Class is Freshman

**OM 460 Supply Chain Management  3 Credit Hours**
This course explores the basic concepts of managing flow of materials in a typical enterprise supply chain. Students will examine a complete overview of material flow, for internal and external suppliers, to and from the enterprise.

**Prerequisite(s):** OM 300 or OM 400

**Restriction(s):**
Can enroll if Level is Undergraduate

**OM 465 Strategic Sourcing  3 Credit Hours**
This course provides an in-depth analysis of the procurement process and supplier management with strong analysis placed on managing a supplier base for both products and services. Both theoretical and quantitative perspectives will be offered. In addition, topics will be addressed from strategic, financial and global perspectives.

**Prerequisite(s):** OM 300 or OM 400

**Restriction(s):**
Can enroll if Class is Sophomore or Junior or Senior

**OM 470 Analys & Desgn of Supply Chain  3 Credit Hours**
The purpose of this course is to equip the student with the ability and the tools necessary to recognize, analyze, and resolve significant problems in the operation of a supply chain system through the application of quantitative techniques. This course focuses on the strategic role of the supply chain, key strategic drivers of supply chain performance, and the tools and techniques for supply chain analysis.

**Prerequisite(s):** OM 300 or OM 400

**Restriction(s):**
Can enroll if Level is Undergraduate

**OM 475 Supply Chain Logistics Mgmt  3 Credit Hours**
The overarching course objective is to develop an in-depth understanding of integrative managerial issues and challenges related to developing and implementing a firm’s logistics strategy. Attention is directed to the logistical mission confronted by varied types of business organizations. Logistics is positioned as a value-adding process that achieves time and place synchronization of demand stimulation and operations fulfillment. Emphasis will be placed on challenges related to providing logistical support for procurement, manufacturing and market-distribution.

**Prerequisite(s):** OM 300 or OM 400

**Restriction(s):**
Can enroll if Level is Undergraduate

**OM 480 ERP in SCM  3 Credit Hours**
This course provides in-depth coverage of the role and impact of enterprise resource planning (ERP) concepts in managing a supply chain. The design of a supply chain information system (SCIS) and its various components is explored utilizing ERP concepts in matching supply and demand through the implementation of an integrated enterprise. Both theory and applications are emphasized in the course. Hands-on experience in the development of some components of SCIS utilizing ERP systems is provided.

**Prerequisite(s):** (OM 300 or OM 400) and (ITM 310 or MIS 310)

**Restriction(s):**
Can enroll if Class is Freshman or Sophomore or Junior or Senior

**OM 483 Seminar: Operations Management  1 to 3 Credit Hours**
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of School of Management.

**Restriction(s):**
Can enroll if Class is Senior
Can enroll if College is Business

**OM 493 Research:Operations Management  1 to 3 Credit Hours**
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.

**Restriction(s):**
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**
The following abbreviations are used to denote the frequency of offering:
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Organizational Behavior (OB)

OB 354 Behavior in Organization 3 Credit Hours
A survey course addressing the theory and practical application of organizational behavior concepts at the individual, group, and organizational levels. Topics include: personality, motivation, groups and teams, leadership, power, ethics, structure and organizational design, culture, and decision-making.
Restriction(s):
Can enroll if Class is Junior or Senior

OB 401 Management Skills Development 3 Credit Hours
This course provides an opportunity to study the concepts, problems and techniques of managing the human resources of an organization with emphasis on the application and skill building. Topics include: skills development for interviewing, counseling, and appraising employees; work team leadership and development; group problem solving and decision making; management of intergroup relationship and conflict resolution.
Prerequisite(s): OB 354
Restriction(s):
Can enroll if Class is Junior or Senior

OB 402 Organizational Change & Devlp 3 Credit Hours
The purpose of this course is to introduce the theories, methods and practice of organizational change and development and to provide a conceptual framework for examples of planned change. Topics will include: processes of organizational change, intervention methods, sequencing and integration of change processes, change roles and role relations, change objectives and criteria for change.
Prerequisite(s): OB 354

OB 403 Negotiation and Conflict Mgt 3 Credit Hours
This course will explore negotiation, power, and conflict, outlining the components of effective negotiation. Distributive, integrative, multi-party, and cross-cultural negotiation situations will be considered. Students will gain experience in preparing and implementing negotiation through in-class negotiations.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

OB 404 Intl Dimensions of Org Behav 3 Credit Hours
This course examines the international dimensions of organizational behavior, including topics such as organizational and national culture, cross-cultural communication, and global aspects of leadership, motivation, and team management.
Prerequisite(s): OB 354
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

OB 485 Seminar:Organizational Behav 1 to 3 Credit Hours
To provide students with an opportunity for intensive study in currently selected areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

OB 485A Seminar:Organizational Behav 3 Credit Hours
TOPIC TITLE: Industrial Training. To explore as completely as time will allow the Management/Corporate training function. To experience various different methods of training and if time permits to visit on-site training locations. To conduct a group training program, one individual paper and two group projects will be required.
Restriction(s):
Can enroll if Class is Senior or Graduate

OB 495 Research:Organizational Behvr 1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
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Philosophy (PHIL)

PHIL 100 Introduction to Philosophy 3 Credit Hours
An introduction to philosophical thinking through an examination of some timeless human problems such as the existence of God, the problem of freedom, and the attempt to find an ethical foundation for life. (F,W).

PHIL 120 Philosophy and Religion 3 Credit Hours
An examination of how basic concerns of philosophy impinge on questions of religious beliefs. Using philosophical texts, the course will explore such questions as the following: Does God exist? Does human life have a purpose? How can we know whether religious claims are true?

PHIL 200 The Human Condition 3 Credit Hours
The human condition as seen in selected works of philosophy and literature. Typical issues: the meaning of life, the existence of God, moral responsibility for human actions, and the role of society in promoting or hindering human excellence. (OC).

PHIL 233 Critical Thinking 3 Credit Hours
A study of the nature and justification of reasoned arguments, both deductive and inductive, as they occur in natural language. A consideration of topics in language that promote an understanding of ways of reasoning, including definitions and fallacies. (F,W).

PHIL 234 Symbolic Logic 3 Credit Hours
This course will examine the central themes in modern symbolic logic including consistency, truth-functionality, sentential first-order predicate logic, and the logic of identity and possibility. These themes and their relation to the wider philosophical context will be discussed. (F,W).
Prerequisite(s): PHIL 233
PHIL 240 Ethics 3 Credit Hours
A study of ethical concepts and theories. Typical questions: Is the morality of an action based on its results or on the intent of the person acting? Is ethics purely rational? What makes a good person? Ethical principles may be applied to such issues as abortion, capitalism, war, and capital punishment. (FW).

PHIL 301 Ancient Philosophy 3 Credit Hours
An examination of the metaphysical, epistemological, ethical, and political theories of the ancient Greek philosophers with particular attention paid to Plato and Aristotle and to the influence of their ideas on Western culture. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 302 Modern Philosophy 3 Credit Hours
A study of 17th and 18th century European philosophers including such philosophers as Descartes, Spinoza, Hume, and Kant with emphasis on their metaphysical and epistemological theories and how those theories provided a foundation for science and a bedrock for modern thought. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 303 Kant and the 19th Century 3 Credit Hours
The development of philosophical thought from Kant through the 19th century. In addition to Kant, figures discussed may include Hegel, Schopenhauer, Marx, Kierkegaard, and Nietzsche. Readings in selected texts. (OC).
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 304 Twentieth-Century Philosophy 3 Credit Hours
A study of selected topics, movements, and figures in the philosophy of the twentieth century, including such representative subjects as continental philosophy, contemporary philosophy of mind, and analytic philosophy. Designed to meet the needs of students in literature and the history of ideas as well as philosophy students. Students electing this course must have successfully completed a previous course in philosophy or have permission of the instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 305 Marxism 3 Credit Hours
This course is an introduction to the philosophy of Marxism which emphasizes Marx's theories of human nature, alienation, class struggle, and revolution through readings of classical and contemporary texts. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor. (OC).
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 306 Islamic Philosophy 3 Credit Hours
The course covers the development of Islam, basic Islamic doctrine, and a selection of issues that have been debated within the Islamic philosophical tradition. Students read original texts by Muslim philosophers and think critically about the issues in them and the arguments raised about them. All readings in English; no knowledge of Arabic required.

PHIL 307 Medieval Philosophy 3 Credit Hours
This course is an introduction to Medieval Philosophy and is structured around the ideas and works of key philosophers in the Christian, Islamic and Jewish religious traditions. It attempts to answer the question of what 'Medieval Philosophy' is and how it fits into the larger context of the Western philosophical tradition. The course is roughly divided into four sections based on the chronological development of philosophy through the Middle Ages – (I) Early Medieval Christian Philosophy, (II) Islamic Philosophy, (III) Jewish Philosophy and (IV) Latin Christian Philosophy in the Thirteenth and Fourteenth Centuries. We will look at what some famous Christian, Muslim and Jewish philosophers, such as Augustine, Boethius, Anselm, Peter Abelard, Al-Ghazali, Ibn Rushd, Saadia, Maimonides, Aquinas, Scotus and Ockham had to say about a diverse range of philosophical issues and topics, including the existence and nature of God, free will, morality, reason and revelation, human nature and the problem of universals. (YR)
Prerequisite(s): PHIL 100 or HUM 200 or PHIL 200 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 350

PHIL 310 Darwinism and Philosophy 3 Credit Hours
Darwinism represents a challenge to the traditional view of human life as radically separate from the rest of the natural world. This course will examine the philosophical implications of this world view. It will address questions such as these: Is Darwinism compatible with traditional religion? Does Darwinism imply that human life and the cosmos are without purpose? Can human life be meaningful if it is the result of evolution and natural selection? Does Darwinism require us to change our view of nature? What are the ethical implications of a Darwinian view of life and the universe?
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490
Restriction(s):
Cannot enroll if Class is
PHIL 312  Environmental Ethics  3 Credit Hours  
The relationship of human beings to the non-human environment raises pressing moral and political issues. This course will use the theories and concepts of philosophical ethics to explore such questions as human obligations to non-human animals; the preservation of wilderness; balancing economic, aesthetic, and spiritual values; and the problems of pollution, urban sprawl, and ecological justice. Prerequisite or permission of instructor. (YR).  
Prerequisite(s): PHIL 100 or PHIL 233 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 325 or PHIL 330 or PHIL 335 or PHIL 340 or PHIL 345 or PHIL 350 or PHIL 355 or PHIL 360 or PHIL 365 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 315  Ethics of War & Peace  3 Credit Hours  
A philosophical exploration of ethical issues underlying war and peace. The course will treat such questions as the following: what wars, if any, are just? Are there moral restrictions on the methods that may be used? What individuals are morally responsible for wartime decisions, and to what degree? Discussion of these issues will be used to elucidate larger problems in ethical theory. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.  
Prerequisite(s): PHIL 100 or PHIL 233 or PHIL 240 or PHIL 365 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 320  The Problem of Human Freedom  3 Credit Hours  
A critical examination of the idea of freedom: the free will/determinism debate, moral and legal responsibility, punishment, and the relationship between metaphysical and social freedom. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.  
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 325 or PHIL 330 or PHIL 335 or PHIL 340 or PHIL 345 or PHIL 350 or PHIL 355 or PHIL 360 or PHIL 365 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 327  Kierkegaard & Nietzsche  3 Credit Hours  
This course will explore the philosophical views of Kierkegaard and Nietzsche, examining the interconnections and differences between these two thinkers as well as each one’s contributions to philosophy and psychology. The course will focus on both philosophers’ emphasis on the individual and how that emphasis arose as a response to the social, political and economic changes in the 19th century and anticipated and influenced philosophical developments in the 20th century, in particular existentialism.

PHIL 335  Philosophy of Law  3 Credit Hours  
An examination of some of the important philosophical issues relevant to law and legal theory, including legal punishment, legal responsibility, and the relationship between law and morality. Both classical and contemporary writings will be studied. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.  
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 325 or PHIL 330 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 360 or PHIL 365 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 340  Analytic Philosophy  3 Credit Hours  
An introduction to philosophy as the analysis and evaluation of fundamental concepts and principles occurring in ordinary life and in the sciences. While analytic philosophy in the twentieth century is emphasized, its antecedents in the history of western philosophy will be examined. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor. (OC).  
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 240 or PHIL 245 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 325 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 350  Symbolic Logic  3 Credit Hours  
This course will examine the central themes in modern symbolic logic including consistency, truth-functionality, sentential first-order predicate logic, and the logic of identity and possibility. These themes and their relation to the wider philosophical context will be discussed. (FW).

PHIL 360  Philosophy of Technology  3 Credit Hours  
A study of both the history of, and current issues in, the philosophy of technology. This course will examine the deeper meaning and implications of our modern technological society. Questions examined include: What is the definition and nature of technology? How did the concept originate in Western thought? What is the relationship between modern industrial technology and the 'mechanistic' worldview? How do Western religious beliefs influence our attitudes about technology? Is technological progress socially determined, or is it culturally independent? In what ways has our technological society been supportive of, or detrimental to, overall human well-being? Students will cover both classic and contemporary readings.

PHIL 365  Philosophy of Religion  3 Credit Hours  
A philosophical examination of basic religious problems, such as the nature and grounds of religious belief, the existence and nature of God, human immortality, the relations of religion and science, and the nature of religious language. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.  
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 325 or PHIL 340 or PHIL 345 or PHIL 350 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 369  Philosophy of Art  3 Credit Hours  
An examination and critique of both traditional and contemporary theories of art as well as an examination of theories of the aesthetic including theories of beauty, taste, and the aesthetic attitude. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor. (OC).  
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 325 or PHIL 340 or PHIL 345 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490 or PHIL 371
PHIL 370 Philosophy of Mind  3 Credit Hours
A study of current philosophical work in the area of consciousness studies examining the nature and function of human consciousness and the problem of reconciling an objective, scientific view of consciousness with our subjective experience of it. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 371 Philosophy in Literature  3 Credit Hours
An exploration of philosophical problems as they are encountered in works of literature. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 375 Problems of Human Knowledge  3 Credit Hours
A study of issues and problems that arise in considering the nature of knowledge: an examination of traditional theories of knowledge and recent critiques of those theories. Readings of classical and contemporary texts. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 380 Theories of Reality  3 Credit Hours
A critical examination of philosophical positions that claim to distinguish between what is real and what is apparent; an evaluation of the basic principles of philosophy and of extra-philosophical disciplines. Readings of classical and contemporary texts. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 590

PHIL 384 Feminist Philosophy  3 Credit Hours
Feminists working in philosophy, most notably in the 19th and 20th centuries, have altered the traditional philosophical canon by first, recovering women philosophers who were essentially erased from the history and secondly, by extending and contributing to the standard questions of philosophy. For example, one central question of philosophy; “What can we know with certainty?” has been transformed through a feminist lens and reinterpreted as “What does one’s gender, social location, and cultural framework contribute to what one knows?” In this course we will look at the variety of feminist philosophical theories with a focus on epistemology, metaphysics, and ethics.
Prerequisite(s): PHIL 100 or WST 275 or WGST 275 or WGST 303 or HUM 275 or ANTH 275 or PSYC 275 or SOC 275 or HUM 303 or ANTH 303 or PSYC 303 or SOC 303
PHIL 390S  Topics in Philosophy  3 Credit Hours
Topic Title: Philosophy of Race- The concept of "race" remains controversial. The controversy concerns two broad issues: first, whether "race" is a legitimate way to demarcate human groups, as opposed to, say ethnicity, or simply seeing all persons as individuals; and, second, whether the continued use of the category of race exacerbates racism. Contemporary philosophers have been making important contributions to these issues, addressing such questions as: what is the true meaning of the concept of "race"? Is the concept of race a mere myth or fiction? Does the use of racial categories exacerbate racism? What race is a mixed race person? What is the race of Latinos or Arabs? How can racism best be reduced and resisted? This course will explore recent philosophical work on the concept of race and the political effects of racial identities. Students will gain an understanding of how philosophers analyze and use concepts, especially as they apply to the politics of race in the U.S. Students will also gain a better understanding of the underlying causes of the rash of police lynching that has galvanized the Black Lives Matter Movement.
Prerequisite(s): PHIL 100 or PHIL 200 or PHIL 233 or PHIL 234 or PHIL 240

PHIL 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in philosophy in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. (F,W).

PHIL 415  Existentialism and Its Sources  3 Credit Hours
An exploration of the literary sources of existentialism and a critical study of selected philosophical texts. Particular themes - death, subjectivity, alienation, commitment, and freedom - will be considered in an attempt to formulate an existential conception of the human condition. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 441  Social and Political Phil  3 Credit Hours
An analysis of some fundamental problems of political and social philosophy, with special attention to the way in which theory may function as a guide to specific policies. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 411 or PHIL 442 or PHIL 485 or PHIL 490

PHIL 442  Medical Ethics  3 Credit Hours
An examination of moral issues in medicine. Among the problems to be considered are truth-telling and paternalism in the doctor-patient relationship, psychosurgery and behavior control, death and euthanasia, the allocation of scarce resources, and genetic counseling and control. Specific attention will be given to ethical theories and to philosophical concepts such as rights, autonomy, and justice. Students cannot receive credit for both PHIL 442 and PHIL 542. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 445 or PHIL 490

PHIL 445  Contemporary Ethical Issues  3 Credit Hours
An intensive study of a topic in recent ethical theory. Topics will vary with each offering. Among the topics: ethics and law, utilitarianism, virtue theory, theories of justice, morality and emotion, ethics and partiality. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 490

PHIL 485  Philosophy of Science  3 Credit Hours
A critical study of the foundations of the sciences, natural and social, with emphasis on the following topics: the nature of scientific method, theories and explanation, probability and determinism, the unity of the sciences. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 490

PHIL 490  Studies in Philosophy  1 to 4 Credit Hours
Intensive study of a figure, movement, or issue in philosophy. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Typical topics: Plato's dialogues, philosophical foundations of mathematics, minds and machines. (OC).

PHIL 496  Independent Studies  1 to 3 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy. Selected in accordance with needs and interests of those enrolled.

PHIL 497  Independent Studies  1 to 3 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy, selected in accordance with the needs and interests of those enrolled.

PHIL 498  Independent Studies  1 to 4 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy, selected in accordance with the needs and interests of those enrolled. Credit hours will vary. (F,W).
PHYS 401 Mechanics 3 Credit Hours
A study of the classical physics of the motions of single particles, systems of particles, and rigid bodies. Topics include central force laws and planetary motion, collisions and scattering, rigid body motion, oscillations, Lagrange’s equations, and Hamilton’s principle. Three hours lecture. (F)
Prerequisite(s): (MATH 205 or MATH 215) and PHYS 150 or PHYS 125
PHYS 403  Electricity and Magnetism  3 Credit Hours
The study of electrostatics, magnetostatics and electrodynamics using Maxwell's equations. Of interest to engineers and physical scientists, the course focuses on the logical development of Maxwell's equations from experimental laws and on their application to electromagnetic phenomena. Three hours lecture. (W).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 151

PHYS 405  Optics  3 Credit Hours
An introduction to wave and ray optics for students in engineering, mathematics, and the physical sciences. Topics of discussion include reflection and refraction at dielectric surfaces, lenses and mirrors, fiber optics, polarization, interference, and Fraunhofer and Fresnel diffraction. Additional material on coherence, Fourier optics and spatial filtering, and holography is presented as dictated by students' needs and interests, and as time permits. Three hours lecture. (AY).
Prerequisite(s): (MATH 205 or Mathematics Placement with a score of 215 or MATH 215) and PHYS 151

PHYS 406  Thermal and Statistical Physic  3 Credit Hours
A study of thermodynamic phenomena using the methods of statistical mechanics. Designed for engineering students and concentrators in mathematics and the physical sciences; extensive application is made to physical, chemical and biological systems and phenomena, including solids, liquids, gases, paramagnets, thermal radiation, DNA, hemoglobin, semiconductors, heat engines, chemical reactions, and phase transitions. Three hours lecture. (F).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 151

PHYS 416  Biological Physics  3 Credit Hours
A course based on the methodology of physics with particular emphasis on the applications of theoretical models and experimental methods to biological objects and systems. Topics may include bioelectricity, membranes, polymers, and physical chemistry of macromolecules. Three hours lecture. (OC).
Prerequisite(s): MATH 205 or (MATH 215 and PHYS 151)

PHYS 421  Astrophysics  3 Credit Hours
A calculus-based introduction to several major areas of modern astrophysics for students concentrating in the physical sciences, mathematics, and engineering. Topics to be covered include observable properties of stars and star systems, stellar structure and evolution, binary systems and galactic x-ray sources, galaxies and quasars, and cosmology. Three hours lecture. (AY).
Prerequisite(s): (PHYS 305 or ASTR 301 or ASTR 330) and (MATH 205 or MATH 215)

PHYS 453  Quantum Mechanics  3 Credit Hours
Concepts of quantum mechanics with applications of the Schrödinger wave equation to the simpler atoms, molecules, and nuclei. Topics of current interest to physicists, chemists, and biologists are discussed. Three hours lecture. (F).
Prerequisite(s): PHYS 305 and MATH 216

PHYS 457  Atomic and Nuclear Physics  3 Credit Hours
Topics in modern atomic physics such as optical and radio-frequency spectroscopy and scattering of atoms and electrons are considered. An introduction to nuclear physics, including nuclear interactions and structure, radioactive decay, fission, and fusion. Three hours lecture. (AY).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 305

PHYS 460  Advanced Physics Laboratory  3 Credit Hours
Experiments in both classical and modern physics using contemporary techniques. Commercial apparatus is used in several experiments. Advanced students are encouraged to initiate and conduct their own experiments. Instruction in the planning of experiments and the presentation of oral and written reports is included. One hour recitation, six hours laboratory. Course may be repeated for credit. (W).
Prerequisite(s): PHYS 305* and PHYS 360

PHYS 463  Solid State Physics  3 Credit Hours
A study of the structure and properties of the solid state of matter with emphasis on crystalline solids, crystal structures, lattice dynamics, electrons in metals and semiconductors, and dielectric and magnetic properties of solids. Three hours lecture. (AY).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 305

PHYS 490  Topics in Physics  1 to 3 Credit Hours
A lecture course in a topic of current interest in physics. Topics vary and are announced in the current Schedule of Classes. One to three hours lecture. (OC).

PHYS 495  Off-Campus Research  1 to 3 Credit Hours
Participation in ongoing experimental research at an off-campus laboratory. Assignments made by cooperative or internship agreement between the research laboratory, the student, and the physics concentration advisor. Course may be repeated for credit. Four to twelve hours laboratory. Permission of concentration advisor. (F,W,S).

PHYS 497  Seminar in Physics  1 to 3 Credit Hours
Current topics from various areas in pure and applied physics are reported upon by students, faculty, and guest lecturers. Topics presented will vary from year to year. Course may be repeated for credit. One to three hours seminar. (W).

PHYS 498  Directed Studies in Physics  1 to 3 Credit Hours
Special topics in physics chosen by agreement between student and instructor. Course may be repeated for credit. Permission of instructor. (F,W,S).

PHYS 499  Laboratory Studies in Physics  1 to 3 Credit Hours
Experimental studies in physics selected by agreement between student and instructor. Four to twelve hours laboratory. Course may be repeated for credit. Permission of instructor. (F,W,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Political Science (POL)

POL 101  American Politics  3 Credit Hours
This course examines the national institutions and political processes of American government. Potential topics include: the Constitution, the Founding, Congress, the Presidency, the Supreme Court, federalism, elections, voting, public opinion, interest groups, political parties, civil rights, civil liberties, or public policy. (F, W)
POL 201 Politics Around the World 3 to 4 Credit Hours
This course examines the world's major forms of government: democracies and non-democracies, their institutions, and the processes that affect their stability and the transitions between them. (F, W).

POL 205 Intro to Public Administration 3 Credit Hours
Introductory study of the administrative phase of public policy development. Such aspects of administration as personnel and fiscal management are considered and related to issue of accountability, public responsibility, and notions of public interest. (F, W).

POL 250 Intro to Political Theory 3 Credit Hours
This course examines the role of political theory as a tool for the critical analysis of political reality. It analyzes several dominant political conceptions such as justice, equality, democracy, civility, and authority. (YR).

POL 260 The Arms Race and War 3 Credit Hours
An examination of the courses and consequences of the contemporary arms race. Special attention is given to nuclear weapons, the risk of war, and the prospect for arms control and disarmament. (YR).

POL 300 Political Analysis 3 Credit Hours
Introduction to research design, data collection and analysis, sampling, and statistics for social scientists. (F, W).

POL 302 The Theory of the Law 3 Credit Hours
A comprehensive introduction to the theoretical foundations and the political functions of law, with special emphasis on the different moral justifications of law; the relation between law and justice; the relation between law and freedom; due process and fairness in any legal system. This course is designed to have special relevance for those considering law as a career. (OC).

POL 303 Justice 3 Credit Hours
An analysis of theories of justice. The relation between morality and political power is considered. (AY).

POL 304 American Political Thought 3 Credit Hours
The principal American contributions to political theory. (OC).

POL 305 Race/Justice/Freedom in Amer 3 Credit Hours
This course examines the social and political thought of selected African American political thinkers. Its focus will be to assess the origins, development and implications of their ideas in the context of the changing dynamics of racial politics in America and the world. (AY).

POL 306 Political Ideologies 3 Credit Hours
An examination of significant modern ideologies, especially liberalism, conservatism, and Marxism. (YR).

POL 307 Marxist Thought 3 Credit Hours
The theories of selected communist thinkers and the implications that these ideas have for the contemporary world. (OC).

POL 308 Moral and Political Dilemmas 2 to 3 Credit Hours
The course focuses on the tensions and relations between personal morality and political action by examining the moral aspect of contemporary policy issues such as the right to life, environmental policy, and discrimination. (YR).

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 309 Ancient Political Theory 3 Credit Hours
An examination of seminal ancient and classical thinkers and texts such as Socrates, Plato, Aristotle, and the Bible on significant themes pertaining to justice, government, religion, and philosophy. (YR).

POL 310 Modern Political Theory 3 Credit Hours
The course studies the origins of modern political theory and practice, and the development of "modern" democratic liberalism. (YR).

POL 311 Int Group and Pol Process 3 Credit Hours
An examination of the structure, techniques, and internal politics of interest groups, their role in policy making and relationship with political parties, legislative and executive bodies, and administrative agencies. (AY).

POL 312 Legislative Process 3 Credit Hours
An analysis of legislative systems with emphasis on the changing realities of congressional and state power and policy making. (YR).

POL 313 American State Government 3 Credit Hours
A comparative analysis of politics, political processes, and governmental institutions in American state and local governments. (YR).

POL 314 Issues in Amer Pol Thought 3 Credit Hours
Fundamental and recurring issues in American political thought, as they appear in the most influential and representative works on public affairs since the end of the Civil War. Topics may include Social Darwinism and its progressive critics, "revisionist" critiques of the Constitution, political aspects of philosophic pragmatism, the "revolt against formalism" in law, political doctrines of Progressivism and the New Deal, mid-century changes in progressive liberalism, the revival of classical liberalism and its "fusion" with traditional conservatism, political-philosophical aspects of environmentalism, the political thought of the civil rights movement and its critics, feminism and its diversification, and the capacities of American political culture and institutions to conduct a sustained opposition to terrorism. The course concentrates on analyzing extended works of reasoning in books, essays, judicial opinions and other public documents. POL 304, American Political Thought, is recommended as a forerunner to this course.

Restriction(s):
Can enroll if Level is Undergraduate

POL 315 The American Presidency 3 Credit Hours
The course examines the expansion of presidential powers, focusing on the constitutional and political development in the president's role as chief executive, legislative leader, and administrative head of state. Topics include: separation of powers, presidential selection, impeachment, relations with Congress and bureaucracy, emergency powers, presidential character, and leadership. (YR).

POL 316 The American Judicial Process 3 Credit Hours

POL 318 Criminal Law 3 Credit Hours
A survey of landmark Supreme Court decisions in the field of criminal law and related issues of criminal justice. State court decisions when applicable may also be included. (AY).

POL 320 Politics and Human Nature 3 Credit Hours
An analysis of the political process in terms of the attitudes, values, and behavior of human beings. (OC).

Prerequisite(s): POL 101

POL 322 Mich Gov, Pol, & Publ Policy 3 Credit Hours
This course explores government, politics, and public policy in Michigan. It examines the major governmental and nongovernmental institutions involved in state level policy making, the processes used by these institutions to influence public policy, and the policies that emerge through their interaction. (YR).
POL 323  Urban Politics  3 Credit Hours
A survey of the political process in urban areas giving special attention to
the changing role of cities in American politics. (YR).

POL 325  Environmental Politics  3 Credit Hours
An examination of policy making about problems affecting the
environment, at a global, national, and local scale. (AY).

POL 326  Presidential/Congress Election  3 Credit Hours
This course will focus on the most recent and upcoming presidential and
congressional elections from the perspective of how they fit into and
help illustrate the broad theoretical frameworks and findings on elections
and voting behavior in political science. Topics will include nominating
and general election campaigns, campaign financing, participation, party
coalitions, and news media. (OC).
Prerequisite(s): POL 101

POL 327  Pol Parties and Elections  3 Credit Hours
A basic survey of American political party organization and the American
election system. The course sometimes includes an examination of
parties and elections in comparative perspective. (YR).

POL 328  Pub Opinion and Press Groups  3 Credit Hours
A study of the nature and formation of public opinion, the techniques for
its measurement, and its role in the political system. (AY).

POL 329  Politics and the Media  3 Credit Hours
This course investigates the relationships between the news media
and our major political institutions; the structure of the modern media;
their influence on public opinion; their effects on our party and electoral
system; their role in defining political reality and agenda setting; and their
influence upon our political institutions and the policy-making process.
(YR).

POL 333  Citizens and Bureaucrats  3 Credit Hours
The focus of this course is citizen participation in administrative
behavior. Attention is paid to the perspectives of both citizens and
bureaucrats. The course uses broad concepts of political participation
and organization behavior. (YR).

POL 334  Organizing and Leadership  3 Credit Hours
The purpose of this course is to introduce students to the theory and
practice of local democratic action. The course draws on the history,
practices, and lessons of the American community organizing tradition
and the civil rights movement and relates those past experiences to
current issues. In collaboration with local community partners, students
learn about effective methods of civic engagement and leadership, as
currently practiced in metropolitan Detroit.

POL 340  Federalism  3 Credit Hours
Federalism is considered from both legal and operational perspectives.
Students examine traditional views of Federalism as well as empirical
and technical studies about intergovernmental relations at national, state,
and metropolitan levels. (YR).

POL 341  Canadian Politics  3 Credit Hours
A survey of Canadian politics and government. It provides an
understanding of the Canadian political tradition and some of the
concerns of contemporary Canada; includes a focus on the cultural
and socioeconomic bases of the political system, the development of
constitutional structures, the scope of public policy and the dynamics of
policy process. (OC).

POL 350  Pol of the Developing Areas  3 Credit Hours
A comparative study of political development, political and governmental
structures, and conflict patterns, especially of an ethnic nature. (AY).

POL 355  Religion and Politics  3 Credit Hours
The primary focus of the course is on political movements or systems
that take a religious form or have a religious base or use a religiously-
rooted ideology. Possible themes or cases covered include the Catholic
Church as a political system, Evangelical politics in America, religious
uprisings, and Islamic political movements. (AY).

POL 360  American Policy Process  3 Credit Hours
An analysis of political decision-making processes on a range of issues
with an emphasis on how various political actors attempt to influence the
process to their own advantage. (YR).

POL 361  American Foreign Policy  3 Credit Hours
Survey of American foreign policy in various regions of the world.
Instances of policy making, such as the Cuban missile crisis, are explored
in detail. (YR).

POL 362  Women, Politics, and the Law  3 Credit Hours
An examination of the political behavior of women in American politics.
Included is an analysis of the legal and legislative demands of American
women. (AY).

POL 363  Cr Just Policy and Admin  3 Credit Hours
The structure and processes of criminal justice administration in
America, including analysis of current issues in police behavior, courts,
and corrections. (AY).

POL 364  Health Pol and Administration  3 Credit Hours
Structure and processes of health administration in America, including
analysis of current issues in health policy. (AY).

POL 365  Energy Policy  3 Credit Hours
The course reviews the important elements in energy policy and a brief
history of that development. It also considers what factors have been
important in those developments. Finally, there is discussion of the
potential for policy developments at all levels of government. (OC).

POL 367  Fiscal Policy and Budgeting  3 Credit Hours
This course is intended to introduce students to the fundamental
elements of the federal budget. During the class we will examine the
budgetary process and how it has evolved over time. Contemporary
proposals to reform the budget process will be considered as well.
Careful attention will also be paid to important components of the federal
budget including entitlements, defense spending, and discretionary non-
defense spending. We will consider various policy reforms as legislators
seek to find ways of maintaining popular programs while controlling
costs. Finally, the course will conclude by examining some famous
budgetary conflicts in recent American history.
Restriction(s):
Can enroll if Level is Undergraduate

POL 370  Communist & Post-Communist Sys  3 Credit Hours
China and Russia are the focal points of this course. Among questions
explored are: How are Russia and China ruled? Are their forms of
government and their economic systems "moderating" and becoming
more like those of the United States? How successful have these
governments been in meeting the needs of the people? (OC).

POL 371  Problems in Intl Politics  3 Credit Hours
Present-day problems in world politics, with particular emphasis on
the great powers and on areas and events of political conflict in the
contemporary world. (YR).

POL 375  Great Pwrs Comp and Conflict  3 Credit Hours
This course focuses on the foreign policies of major international powers,
such as China, Russia, and the Western European democracies. Attention
is also paid to the causes of the rise and decline of major powers. (YR).
POL 385  Israeli-Palestinian Conflict  3 Credit Hours
The course focuses on the Israeli-Palestine conflict in its domestic, regional, and world-wide dimensions. (W, YR).

POL 390  Topics in Political Science  3 Credit Hours
Examination of problems and issues in selected areas of political science. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

POL 390J  Topics in Political Science  3 Credit Hours
Topic: Freedom of Religion in America. This course is designed to explore a variety of historical and contemporary issues dealing with freedom of religion as guaranteed in the First Amendment of the Bill of Rights. Special attention will be given to the landmark decisions of the Supreme Court interpreting the Establishment and Free Exercise clauses of the First Amendment and the legal and political controversies raised by these decisions. The course is designed to lead to a greater understanding of the symbiotic relationship between religion and politics, the importance of religious liberty to democracy, and the inevitable tensions between religious groups, and between church and state in a free society.
Prerequisite(s): HIST 365

POL 398  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in Political Science in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor.

POL 399  Independent Study  1 Credit Hour
readings or analytical assignments in political sciences in accordance with the interests and needs of students enrolled and agreed upon by the instructor and student. Written permission of instructor required.

POL 413  American Constitutional Law  3 Credit Hours
A major theme of this course is the development of the Constitution as shaped by the Supreme Court, Congress, and the president. The course examines the constitutional interpretation of government authority which includes such topics as judicial review, appointments, executive privilege, war power, federalism, commerce power, taxing and spending power, and substantive due process. (AY).
Restriction(s):
Cannot enroll if Class is

POL 414  Civil Rights and Liberties  3 Credit Hours
An analysis of the Bill of Rights and the 14th Amendment, with particular emphasis upon recent landmark or controversial Supreme Court decisions dealing with freedom of speech and religion, rights of criminal defendants; cruel and unusual punishment, right to privacy; civil rights and equal protection clause; and apportionment. (YR).
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

POL 415  Problems in Constitutional Law  3 Credit Hours
Selected areas of constitutional law of current interest. Topics to be announced. (AY).
Restriction(s):
Can enroll if Class is Junior or Senior

POL 4165  Criminal Law  3 Credit Hours
A survey of the major judicial, executive, and legislative decisions in the field of criminal law. (AY).

POL 417  Constitution&National Security  3 Credit Hours
This course focuses on the issue of national security and how the federal government has used power to protect its citizens. It analyzes relevant national security issues in order to understand how government action is constrained by the Constitution and social norms. The course examines the historical development of national security in the United States including habeas corpus, wiretapping, military tribunals, state secrets, and extraordinary rendition. Particular close attention is paid to the modern development of national security. The emphasis in reading will be on cases, executive orders, congressional hearings, and statutes. For graduate credit elect POL 517.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 418  Supreme Court and Religion  3 Credit Hours
A study of the major landmark decisions of the Supreme Court interpreting First Amendment guarantees of religious liberty. The course emphasizes case law defining the meaning of the Establishment Clause and the Free Exercise Clause and their significance for religious liberty in America.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 445  Environmental Law  3 Credit Hours
A survey of common law theories and analysis of environmental statutes from a functional perspective. The course also includes environmental law aspects of constitutional law, administrative law and criminal law, as well as the public trust doctrine and public lands. Student cannot receive credit for both ENST 350 and ENST/POL 445.

POL 450  Revolution  3 Credit Hours
A consideration of violent political change and the conditions which promote it. The course covers both revolutionary theories and empirical research. Specific revolutions are considered. (YR).
Restriction(s):
Cannot enroll if Class is

POL 451  Peace and War  3 Credit Hours
An examination of the causes of war and the means of securing peace. (YR).
Prerequisite(s): HIST 365 or HONS 300
Restriction(s):
Cannot enroll if Class is
Can enroll if Attribute is Honors Program

POL 4605  Science, Tech & Pub Policy  3 Credit Hours
This course explores the intersection of science, technology, and public policy. Scientific knowledge and technological innovations are exceptionally powerful resources for policy-makers and for societies; they also pose great challenges and risks. This course will look at how science and technology affect the pursuit of policy goals in areas such as public health, environmental sustainability, economic growth, and national security. Students will not receive credit for more than one of POL 460, POL 560, and PPOL 560.
Restriction(s):
Cannot enroll if Class is Graduate

POL 466  Politics&Policies Soc Welfare  3 Credit Hours
The course examines the relationship between politics and public policy as related to the provision of social welfare programs in the United States.
Restriction(s):
Cannot enroll if Class is Freshman
POL 467  Food Politics and Policy  3 Credit Hours
How do politics affect our food at the global, national and urban/local scale? This course examines close historical relationships between politics and food; the politics of conventional agriculture and food policy; and alternative agriculture movements and food systems, with a particular emphasis on urban food policy and urban food systems.

POL 471  American Foreign Policy I  3 Credit Hours
American foreign policy in Western Europe, Russia, and Latin America. (OC).
Restriction(s):
Can enroll if Class is Junior or Senior

POL 472  American Foreign Policy II  3 Credit Hours
American foreign policy in the non-western world. (OC).
Restriction(s):
Can enroll if Class is Junior or Senior

POL 473  International Security Affairs  3 Credit Hours
International Security is the branch of world politics concerned with the threats, primarily military in nature, to the peace and security of the nation, states, and the international community. (AY).
Restriction(s):
Can enroll if Class is Junior or Senior

POL 481  Terrorism & US Natl Security  3 Credit Hours
The United States responded to the events of September 11, 2001 with a series of unprecedented action under the umbrella of homeland security and the ?War on Terror.? This course examines American National security policy by asking a few key questions: What is terrorism and how does it threaten the United States? How has the United States responded to the threat of terrorism over time? What have the consequences of US policy been to date? Finally, how would we balance a desire for security with our desire for civil liberties and ethical action?
Prerequisite(s): CRJ 468
Restriction(s):
Can enroll if Level is Undergraduate

POL 482  Comparative Enviro Policy  3 Credit Hours
This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages - from defining an issue as an environmental problem to placing it on political agenda and then receiving a response at domestic governmental or international levels. This course analyzes environmental issues from a cross-cultural and comparative perspective, with a particular attention given to political institutions, political change, levels of development, political culture, public participation, and international commitments that shape the nature and dynamics of environmental politics and policy in different countries. Course POL 101 is recommended before taking this course.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 484  Revitalizing Cities  3 Credit Hours
What have we done to address decline in city neighborhoods and downtowns? Why? How has it worked? Why? What’s the hope for the future? This course uses a public policy lens to engage students in a quest for answers to these questions. (YR)

POL 487  Seminar in Urban Politics  3 Credit Hours
Selected topics in urban politics.

POL 490  Sem in Public Administration  2 to 3 Credit Hours
Selected topics in public administration.

POL 491  Seminar in Political Science  3 Credit Hours
Selected topics in political science. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when topics differ. (AY).

POL 492  Seminar in Political Analysis  3 Credit Hours
An advanced in-depth look at the problems and techniques of empirical research. Gives special attention to research design, data collections, measurement, and validity. Statistics for social scientists will also be covered. (OC).

POL 494  Internship Seminar  3 Credit Hours
This is the academic part of the internship. Students meet with other interns once a week to analyze political dynamics within their placements. Students are required to keep journals, prepare papers and reports, and do other written work. Anyone taking POL 495 or 497 is required to take POL 494. It may not be taken by itself. Repeatable if topic differs. Only six hours of internship credit is alloweable toward concentration requirement.

POL 495  Public Affairs Internship  3 to 6 Credit Hours
Field study placements in national, state, county, local government or private agencies. Primarily for junior or senior political science concentrators or other qualified applicants. Maximum of 20 students selected each term. Students must also register for POL 494. Only six hours of internship credit is alloweable toward concentration requirement.

POL 496  Canada Internship  3 or 6 Credit Hours
Field study placements in Canada at national, provincial, or local levels, or in private agencies. Course is offered only in spring semester. Primarily for junior or senior political science concentrators, or other qualified applicants. Students must also register for POL 494. Only six hours of internship credit is allowed toward concentration requirement.

POL 497  Washington, D.C. Internship  3 to 6 Credit Hours
Field placements in Washington, D.C. Course is offered only in summer semester. Primarily for junior or senior political science concentrators or other qualified applicants. Only six hours of internship credit is allowed toward concentration requirement.

POL 498  Directed Studies  1 to 6 Credit Hours
Directed individual study of any subject agreed upon by the student and the instructor. May not duplicate a formal course offering. (OC).

POL 499  Directed Studies  1 to 6 Credit Hours
Directed individual study of any subjects agreed upon by the student and the advising instructor, which shall not duplicate a formal course offering.

An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Professional Education (PDED)

PDED 318  Topics in Education  1 to 3 Credit Hours
An examination, at the undergraduate level, of selected problems, practices or issues in education. The title as listed in the Schedule of Classes may change according to content. Course may be repeated for credit when specific topics differ.  
Restriction(s):
Can enroll if Class is Junior or Graduate  

PDED 405  Sp Ed Legisln and Litigation  3 Credit Hours
Content traces the historical development of special education through landmark legislation and litigation, parent advocacy, and national economic and social needs. The provisions of federal and state special education mandates, judicial interpretations, and Michigan state guidelines regulating the delivery of educational and vocational services to persons with handicaps will also be addressed.  
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate  

PDED 407  Topics in Education  1 Credit Hour
This course is intended to introduce students to the characteristics and implications for educators, pupils, and parents. Consideration will be given to the legal aspects of such matters as physical threats, teacher liability, codes of conduct, discipline, and student rights.  
Restriction(s):
Can enroll if Class is Undergrad Certification only or Junior or Senior  
Can enroll if College is Education, Health, and Human Services  

PDED 408  Topics in Education  1 Credit Hour
This course is intended to introduce students to the characteristics and assessment of persons with ASD, as well as the best practices related to educating students with Autism Spectrum Disorders (ASD). Specifically, students will learn evidence based practices for assessing students with ASD, creating an appropriate educational environment for students with ASD, and providing academic instruction and behavioral interventions to students with ASD in special education and general education settings. Instruction will emphasize specific assessment and teaching tools and behavior management principles and practices associated with educating K-12 student with ASD.  
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergraduate  
NCFD or Undergrad Certification only or Post-baccalaureate NCFD or Junior or Senior  
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services  

PDED 415  Museum Resources for Teaching  3 Credit Hours
Explores the use of museums as educational resources by elementary and secondary teachers. Various museums in the greater Detroit metropolitan area will be visited and studied. Students will review how to plan educational trips and how to use museum resources in meeting their own particular individual needs.  
Restriction(s):
Can enroll if Class is Undergrad Certification only or Junior or Senior  
Can enroll if College is Education, Health, and Human Services  

PDED 416  Internship in Museum Education  2 or 3 Credit Hours
The museum education internship will prepare students with the knowledge and skills they need to plan, implement, and evaluate educational and interpretive programs in the context of museums. The educational functions of museums will be explored. The students will apply their knowledge and experiences to K-12 instruction in the core content areas.  
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior  
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services  

PDED 418  Topics in Education  1 to 3 Credit Hours
This course is intended to introduce students to the characteristics and assessment of persons with ASD, as well as the best practices related to educating students with Autism Spectrum Disorders (ASD). Specifically, students will learn evidence based practices for assessing students with ASD, creating an appropriate educational environment for students with ASD, and providing academic instruction and behavioral interventions to students with ASD in special education and general education settings. Instruction will emphasize specific assessment and teaching tools and behavior management principles and practices associated with educating K-12 student with ASD.  
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergraduate  
NCFD or Undergrad Certification only or Post-baccalaureate NCFD or Junior or Senior  
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services  

PDED 418BJ  Topics in Education  1 Credit Hour
TOPIC TITLE: Transdisciplinary Teaming to Support students with Challenging Behaviors  
This course explores the concept of transdisciplinary teaming for the purpose of supporting children/youth with challenging behaviors. Topics of study in this course include multi-level systems for preventing and remediating inappropriate behaviors, school-wide, class-wide, and individual research-based interventions including Functional Behavior Assessment (FBA).  

PDED 418BS  The Educational Escape Room  1 Credit Hour
Topic Title: The Educational Escape Room  
Participants will learn how to develop educational escape rooms that can be used to engaged students in different content areas. Focus will be placed on crafting a relevant scenario, creating logical hints, and integrating the escape room activity into the curriculum. Participants will be introduced to a variety of tools and technologies that can be used to create escape room activities.  

PDED 418BU  Creating a Maker Space  1 Credit Hour
Topic Title: Creating a Maker Space  
Participants will learn how to create a Maker Space within their own school or classroom. A variety of resources will be shared to help reduce the cost of developing a Maker Space. Participants will also learn about ways to design learning activities that utilize a Maker Space in order to advance the curriculum in different content areas.  

PDED 418CB  Topics in Education  1 to 3 Credit Hours
TOPIC TITLE: TESOL Abroad: Best Practices for Teaching English to Speakers of Other Languages  
This course provides international TESOL instructors with the background to the theory and best practices for teaching English in non-English speaking countries for academic and professional purposes. The course is designed to provide TESOL instructors with strategies that can be effectively implemented in their English language courses to promote their students’ English language academic proficiencies.  

PDED 425  Educator and the Law  1 to 2 Credit Hours
Designed to familiarize classroom teachers with school law and its implications for educators, pupils, and parents. Consideration will be given to the legal aspects of such matters as physical threats, teacher liability, codes of conduct, discipline, and student rights.  
Restriction(s):
Can enroll if Class is Undergrad Certification only or Junior or Senior  
Can enroll if College is Education, Health, and Human Services  

Other Content
* An asterisk denotes that a course may be taken concurrently.  
Frequency of Offering
The following abbreviations are used to denote the frequency of offering:  
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally  
* An asterisk denotes that a course may be taken concurrently.  
Frequency of Offering
The following abbreviations are used to denote the frequency of offering:  
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
### Psychology (PSYC)

**PSYC 101  Introduction to Psychology  3 Credit Hours**
Psychology 101 introduces students to theories and research in the field of psychology. This course focuses on the scientific underpinnings of the field from both the social and natural science perspectives.

**PSYC 170  Intro to Psych as a Nat Sci  3 Credit Hours**
A treatment of the principles of sensation, perception, maturation, learning, motivation, memory, thought, language, and physiological bases of behavior. (F,W,S).

**PSYC 171  Intro to Psych as a Soc Sci  3 Credit Hours**
A treatment of the principles of human development, intelligence, motivation, personality theory, social and abnormal psychology, and psychotherapy. (F,W,S).

**PSYC 215  Research Skills BSci  1 Credit Hour**
Full Title: Research Skills for the Behavioral Sciences: This course teaches foundational research and critical-thinking skills necessary for the success of Behavioral Sciences students (including Anthropology, Psychology, and Sociology) in conducting university-level research projects, papers, and other research assignments. Students will learn important research skills like distinguishing between scholarly and non-scholarly sources of information, using library search tools to find peer-reviewed and scholarly sources, evaluating and analyzing information sources and using them to build informed opinions and arguments, integrating and synthesizing sources, and using sources ethically. Students will learn these skills through lectures, practice and by applying them through a series of assignments. (F, W, S).

**Restriction(s):**
- Can enroll if Level is Undergraduate
- Can enroll if College is Arts, Sciences, and Letters

**PSYC 299  Careers in Psychology  1 Credit Hour**
This one-credit course for psychology majors provides students with information and skills to help pursue a career in psychology or in a related field. The course focuses on career options within each of the major subfields of psychology. Psychological research on resumes, interviewing and negotiation skills, and networking is incorporated into the course. Students develop a career plan, write a resume, and complete an e-portfolio. (F, W, S)

**PSYC 300  Life-Span Developmental Psych  3 Credit Hours**
Theoretical issues of psychological development from birth through late adulthood are emphasized, along with issues regarding research methods. Topics include cognitive, intellectual, personality, and social development through the life-span. (YR).

**Prerequisite(s):**
- PSYC 101 or PSYC 170 or PSYC 171

**PSYC 301  Psych of Infant Development  3 Credit Hours**
An examination of current theories and findings concerning physical, social, emotional, and intellectual development of the infant. Topics include genetic and experiential factors affecting prenatal and infant development. language, cognition, and environmental influences on development. Theory will be related to infant care practices in families.

**Prerequisite(s):**
- PSYC 171 or PSYC 170 or PSYC 101

**PSYC 302  Psych of Child Development  3 Credit Hours**
An examination of current theories and findings concerning physical, social, emotional, and intellectual development from conception to late childhood. Topics include genetic and experiential factors affecting child development.

**Prerequisite(s):**
- PSYC 170 or PSYC 171 or PSYC 101

**PSYC 303  Intro to Women’s & Gender Stud  3 Credit Hours**
This course provides an interdisciplinary overview of the key theories and topics in Women’s and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women’s and men’s lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.

**Restriction(s):**
- Cannot enroll if Class is Freshman

**PSYC 315  Personality Development  3 Credit Hours**
An investigation of the factors involved in the formation of personality and the changes in personality across the life-span. The influence of family, peers, and society will be emphasized. (YR).

**Prerequisite(s):**
- PSYC 171 or PSYC 170 or PSYC 101

**PSYC 320  Social Psychology  3 Credit Hours**
An introductory study of the inter-relationships of the functioning of social systems and the behavior and attitudes of individuals. (YR).

**Prerequisite(s):**
- PSYC 101 or PSYC 170 or PSYC 171

**PSYC 321  Attitude and Social Behavior  3 Credit Hours**
An analysis of social attitudes as they relate to personality and to membership in collective structures; the conditions of their formation and modification. (YR).

**Prerequisite(s):**
- PSYC 171 or PSYC 170 or PSYC 101

**PSYC 322  Psychology of Prejudice  3 Credit Hours**
A consideration of ethnic (including racial), sexual, and religious prejudice from the psychological point of view, focusing on the mind of both the oppressor and the oppressed. (YR).

**Prerequisite(s):**
- PSYC 171 or PSYC 170 or PSYC 101

**PSYC 325  Psych of Interpersonal Relation  3 Credit Hours**
This course presents an overview of theory and research conducted by social psychologists that has been aimed at understanding interactions between individuals. Topics include an exploration of the research process that is used to investigate interpersonal relationships, the processes underlying social perception, friendship, liking, love, close relationships, aggression and violence in interpersonal relationships. (YR).

**Prerequisite(s):**
- PSYC 101 or PSYC 170 or PSYC 171

**PSYC 335  Psychology of Bilingualism  3 Credit Hours**
This course is an introduction to the study of bilingualism with a focus on biological and cognitive aspects of bilingualism. Topics covered include definitions and types of bilingualism; differences between monolinguals and bilinguals; language development in children and adults and differences between early and late learning; brain areas involved using one and multiple languages; language processing in bilinguals, including topics such as working memory, executive control, proficiency, age of acquisition, and language attrition; and the relationship between language, thought, and culture. We will also discuss social aspects of bilingualism, including heritage language, identity, and attitudes. (FW)

**Prerequisite(s):**
- PSYC 101

**PSYC 363  Cognitive Psychology  3 Credit Hours**
Analysis of human perceptual and cognitive functioning from an information-processing point of view. Emphasis will be placed on attention, pattern-recognition, memory, problem solving and other cognitive processes. (YR).

**Prerequisite(s):**
- PSYC 170 or PSYC 171 or PSYC 101
PSYC 370  Physiological Psychology  3 Credit Hours
Integration of physiological concepts with behavioral phenomena. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 372  Animal Behavior  3 Credit Hours
Comparative psychology. Descriptive analysis of human and animal behavior. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or BIOL 100 or PSYC 101

PSYC 375  Psychology of Language  3 Credit Hours
The nature of human language as seen from the perspective of experimental psychology. The course will also introduce the student to current developments in linguistic theory. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or LING 280 or PSYC 101

PSYC 381  Prin of Stat and Exper Design  3 Credit Hours
An introduction to basic principles of experimental design and statistical analysis as employed in psychological research. Topics covered include data-gathering, descriptive statistics, hypothesis-testing and one- and two-sample experiments, correlation designs, and one- and two-way analysis of variance. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 390  Topics in Psychology  3 Credit Hours
Examination of problems and issues in selected areas of psychology. Title listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 391  Topics in Psychology  3 Credit Hours
Examination of problems and issues in selected areas of psychology. Title listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

PSYC 394  Psychology and Theater  3 Credit Hours
The linkages between psychology and theater are analyzed from the perspective of the actor, the audience, and the analyst (both psychotherapeutic and literary). This includes ties between plays and theories of human behavior, psychodrama, and self-insight through performance. Class involves a significant experiential component.
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 395  Diversity and the Workplace  3 Credit Hours
This course will: 1) discuss gender, race, ethnicity, disability, age, sexual orientation, and appearance as aspects of diversity; 2) examine social values and practices, and organizational policies and procedures that affect or have affected the employment opportunities of underrepresented groups; 3) examine individual (e.g., prejudice, stereotypes), group (e.g., in-groups and out-groups), and organizational (e.g., climate and culture) processes that affect workplace diversity and; 4) discuss "best practices" for promoting an organizational culture that values diversity, along with a diverse work force.
Prerequisite(s): PSYC 170 or PSYC 171 or WST 275 or OB 354 or HRM 405 or WGST 275 or WGST 303 or PSYC 275 or ANTH 275 or SOC 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303 or PSYC 101

PSYC 398  Independent Studies in Psych  1 to 3 Credit Hours
Readings or analytical research in psychology selected in accordance with the interests and needs of students enrolled and agreed upon by the instructor and student. Permission of instructor. (F,W,S).

PSYC 400  Cognitive Neuroscience  3 Credit Hours
Cognitive neuroscience focuses on the fundamental question of how our nervous system, especially the brain, supports our (generally-defined) cognitive function, such as sensory/perception, learning/memory, language social/emotion, and executive functions. This is a fast-growing inter-disciplinary research field that bridges psychology and neurobiology. In this course, we will discuss the recent advances in these cognitive neuroscience subfields and learn how various brain systems may play unique roles in supporting these distinct functions. We will also discuss important research methods/techniques used in cognitive neuroscience, such as the functional Magnetic Resonance Imaging (fMRI), Electro/Magnetoencephalography (EEG/MEG), intracranial recording, and brain damage/lesion/stimulation methods, and related research paradigms and resulted theories. Students will also learn to read and criticize cognitive neuroscience research articles. Gross neuroanatomy will be introduced to provide a foundation for understanding systems and interconnectedness of the brain and related cognitive processing.
How cognitive neuroscience can help us better understand normal and pathological psychological functions will be discussed. (F)
Prerequisite(s): (PSYC 170 or PSYC 171 or PSYC 101) and (PSYC 363 or PSYC 375 or PSYC 461 or PSYC 463 or PSYC 464)

PSYC 404  Parent-Child Relations  3 Credit Hours
This course examines parental effects on children and children's effects on parents. Emphasis is placed on how the psychologist can collect additional information on the interactions of such people as parents and their children. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 405  Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Students cannot receive credit for both PSYC 405 and PSYC 505. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or SOC 200 or SOC 201 or PSYC 101
Restriction(s):
Cannot enroll if Class is Graduate

PSYC 407  Psychology of Adolescence  3 Credit Hours
Considers adolescence as an interaction of rapid biological and social change. Students lacking the prerequisite may elect course with permission of instructor. Examines the theoretical and empirical literature in some detail. Students cannot receive credit both both PSYC 407 and PSYC 507. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 412  Psychology of Aging  3 Credit Hours
This course examines development of the individual from middle adulthood through old age. Special emphasis is given to the understanding of developmental theories and issues in adulthood. Topics include biological basis, socialization, family relationships, personality, and intellectual development in the aging individual. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101
PSYC 415  Lab in Developmental Psych  3 Credit Hours
An examination of research design and methodology as related to developmental psychology. Special emphasis will be given to training students in data collection techniques used in developmental research and in providing practical experience in designing and conducting research. Students cannot receive credit for both PSYC 415 and PSYC 515. (YR).
Prerequisite(s): (PSYC 300 or PSYC 301 or PSYC 303 or PSYC 407 or PSYC 412) and PSYC 381

PSYC 418  Cognitive Development  3 Credit Hours
This course explores theories and methods in cognitive development focusing on Piaget’s theory and more recent significant conceptualizations. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 421  Group Processes  3 Credit Hours
Topics treated include group cohesiveness, “group think,” the social structure of groups, emotional factors in group life, leadership, and the development of groups. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or PSYC 101

PSYC 422  Psychology of Leadership  3 Credit Hours
Analysis of theories and research findings in the field of leadership. Class participation includes discussing leadership and group interactions. Students cannot receive credit for both PSYC 422 and PSYC 522. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 425  Lab in Social Psychology  4 Credit Hours
A broad introduction to research methods in basic and applied social psychology. Students will receive training in construction, implementation, and interpretation of scientific procedures used in the study of social psychology. Topics include: questionnaire construction, experimental design, and various multivariate analytic techniques. (YR).
Prerequisite(s): PSYC 381

PSYC 426  Applied Social Psychology  3 Credit Hours
The field of Applied Social Psychology utilizes social psychological theory and research to understand social problems with the goal of improving social conditions. This course will examine social issues from both macro (social institutions and policies) and micro (interpersonal/intergroup behaviors and beliefs) perspectives. We will investigate how social institutions such as social policy, mass media, and education impact individuals, families, communities, and the environment. (YR)
Prerequisite(s): (PSYC 101 or PSYC 170 or PSYC 171) and (PSYC 320 or SOC 382 or CRJ 382)
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 427  Media Psychology  3 Credit Hours
Media Psychology is the branch of psychology that focuses on the psychological processes associated with media, technology use and the impact that these have on individuals and society. This seminar class will provide an in-depth examination of research methods and psychological theories related to persuasion, media effects, media identification and media participation. Research across several content areas including, aggression, prosocial behavior, health and well-being, risky behaviors, relationships, news and politics, as well as media literacy, will also be considered. (YR)
Prerequisite(s): (PSYC 101 or PSYC 170 or PSYC 171) and (PSYC 320 or SOC 382 or CRJ 382)

PSYC 428  Self & Identity  3 Credit Hours
This course provides an in-depth exploration of the vast body of research concerning psychological perspectives on the self and identity. Through reading academic journal articles pertaining to theories and research findings about the self and identity, students will learn about a) the structure and components of self and identity, b) self-knowledge and self-assessment, c) self-damage, d) self-protection and self-enhancement, and e) aspects of the psychologically healthy self.
Prerequisite(s): PSYC 101 or PSYC 170 or PSYC 171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

PSYC 430  Psychology in the Workplace  3 Credit Hours
This course introduces students to some of the core content areas of Industrial/Organizational (I/O) psychology. These content areas include: selection, training, performance appraisal, work teams, job design, motivation, leadership, union-management relations, and stress and health in the workplace. Students cannot receive credit for both PSYC 430 and PSYC 530. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or OB 354 or PSYC 101

PSYC 431  Organizational Entry  3 Credit Hours
An in-depth consideration of the psychological aspects of the organizational entry process. Topics to be covered include recruitment, selection, orientation, socialization, and training. (OC).
Prerequisite(s): PSYC 170 or PSYC 171 or HRM 405 or OB 354 or PSYC 101
Restriction(s):
Cannot enroll if Class is Graduate
Can enroll if Level is Undergraduate

PSYC 432  Socialization of the Child  3 Credit Hours
An in-depth consideration of some major social systems that affect the development of the child. Students lacking the prerequisite may elect course with permission of instructor. Students cannot receive credit for both PSYC 432 and PSYC 532. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior
PSYC 440  Abnormal Psychology  3 Credit Hours
An introduction to the field of psychopathology, the study of mental disorders. Includes exposure to a number of historical and theoretical perspectives, each with their own theories, methodologies, and treatment approaches. Disorders covered will include: anxiety and mood disorders, personality disorders, schizophrenia, sexual disorders, and psychosomatic disorders. Students cannot receive credit for both PSYC 440 and PSYC 540. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 441  Intro to Clinical Psychology  3 Credit Hours
Introduction to the logic, problems, and limitations of clinical observations and inference. Issues in diagnosis and treatment are examined, with an attempt to understand parallels between clinical interpretation and problems in other disciplines. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 442  Child Psychopathology  3 Credit Hours
A review of the major psychological disorders of children from birth to adolescence. These disorders are considered from a clinical and theoretical point of view. In addition to an examination of causes, approaches to treatment and behavior modification are considered. Students cannot receive credit for both PSYC 442 and PSYC 542. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 4445  Personality Assessment Lab  4 Credit Hours
This is a course in methods of assessing personality. The theory and methods of observation, interviewing, questionnaires, IQ tests, and projective tests are discussed and employed in brief individually-designed studies. In addition to the course prerequisite, students should have at least three upper-level psychology credits and junior or senior standing or permission of the instructor. Students cannot receive credit for both PSYC 4445 and PSYC 544. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Cannot enroll if Class is

PSYC 446  Human Sexual Behavior  3 Credit Hours
A comprehensive review of facts about human sexuality. The emphasis is on psychological aspects of sex, but there is also a consideration of genetic, physiological, and anatomical aspects of sex, and contemporary issues. Students cannot receive credit for both PSYC 446 and PSYC 546. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 450  Personality Theory  3 Credit Hours
A comparative review and examination of leading theories of personality; their basic concepts, similarities and differences, applications in clinical psychology, in education, in social planning, and in research. Students cannot receive credit for both PSYC 450 and PSYC 550. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 451  Prin of Counseling and Psych  3 Credit Hours
An introduction to traditional and innovative methods of psychological counseling and psychotherapy with an emphasis upon the theoretical foundations of personality and behavior change. Differences and similarities among the various schools of counseling and psychotherapy will be examined among with the values and limitations common to them all. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 455  Health Psychology  3 Credit Hours
A discussion of the research on health promotion, psychological factors in the development of illness, cognitive representations of health and illness, stress and coping, social support, nutrition and exercise. Focus will be on the factors related to the development and maintenance of optimal health. Students cannot receive credit for both PSYC 455 and PSYC 555. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Cannot enroll if Class is

PSYC 456  Sport Psychology  3 Credit Hours
A consideration of research and theory aimed at two objectives: (a) understanding how psychological variables affect physical performance and (b) understanding how participation in sports influences psychological development. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 457  Positive Psychology  3 Credit Hours
This course examines the contemporary movement of positive psychology, which uses the tools of rigorous science to explore the sources and nature of human strengths and psychological well-being. It then seeks to apply this knowledge to help individuals and institutions function more effectively. Topics include the biological basis of positive emotions, resilience and post-traumatic growth, positive relationships, positive education, positive workplaces, and positive development across the lifespan. (YR)
Prerequisite(s): PSYC 101

PSYC 461  Learning and Memory  3 Credit Hours
A consideration of major theories and research results related to learning and memory in humans and animals. Students cannot receive credit for both PSYC 461 and PSYC 561. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 463  Sensation and Perception  3 Credit Hours
Analysis of basic sensory and perceptual phenomena with a review of relevant behavioral and physiological literature. Students cannot receive credit for both PSYC 463 and PSYC 563. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 464  Applied Cognitive Psychology  3 Credit Hours
The focus will be on the application of principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language.
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 465  Experimental Psychology  4 Credit Hours
Laboratory course in Experimental Psychology, including sensation, perception, learning, memory, language, and problem solving. Students will perform standard experiments, design one or two new modified experiments, collect data, analyze results, and present them in the form of laboratory reports. (YR).
Prerequisite(s): (PSYC 170 or PSYC 171 or PSYC 101) and PSYC 381
Prerequisite(s): PSYC 370
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 470 Advanced Physiological Psych 3 Credit Hours
Further study of the subject matter of PSYC 370. Advanced study of topics in the area of psychobiology. Students cannot receive credit for both PSYC 470 and PSYC 570. (YR).
Prerequisite(s): PSYC 370

PSYC 471 Reproductive Phys and Beh 3 Credit Hours
An in-depth examination of reproduction from a physiological and psychological viewpoint. Physiological topics include anatomy, hormones, and neural mechanisms. Psychological topics include behavior development and descriptions. Students cannot receive credit for both PSYC 471 and PSYC 571. (YR)
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 472 Motivation and Behavior 3 Credit Hours
Study of the psychobiological aspects of motivated behavior. Topics include hunger, aggression, sex, sleep, and achievement. Students cannot receive credit for both PSYC 472 and PSYC 572. Prerequisites or permission of instructor. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 473 Clinical Neuropsychology 3 Credit Hours
This course is an in-depth examination of the field of clinical neuropsychology including a review of brain anatomy and physiology, theories of neural organization, and disorders of the nervous system. In addition, students will learn techniques utilized in neuropsychological assessment. (Prerequisite may be waived for students with Natural Science background.) (YR).
Prerequisite(s): PSYC 370

PSYC 474 Animal Learning and Cognition 3 Credit Hours
Animal Intelligence involves the study of human and non-human animal behavior and cognition in an evolutionary and comparative framework. As an introduction to human and non-human animal cognition and though processes this course will examine topics such as problem-solving, spatial cognition, categorization, memory, number concepts, tool-use and tool-production, insight, imitation, social cognition, self-recognition and language(-like) behavior. In addition to discussing basic experimental findings about cognition in animals, an emphasis is placed on the logic and evidence used to justify theoretical conclusions. The course requires reading and critiquing original journal articles in addition to textbook chapters for foundational concepts.
Prerequisite(s): PSYC 372 or PSYC 363 or PSYC 461 or BIOL 419 or BIOL 456 or ANTH 336
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

PSYC 480 History of Psychology 3 Credit Hours
An overview of the development of modern psychology from the 17th century to the present, with particular emphasis on the beginning of psychology in America. The philosophical assumptions of various schools of psychology will be examined. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 481 Computers in Psychological Res 3 Credit Hours
An introduction to the use of computers in data analysis and psychological research. Students will receive training in computer programming using SPSSPC and other software packages. Topics will include: correlation, regression, analysis of variance, and several multivariate techniques. (YR).
Prerequisite(s): PSYC 381

PSYC 485 Psychology Internship 3 or 6 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, geriatrics, human resources/staff development, cognitive impairment, criminal probation, teenage runaways, substance abuse, and women’s issues. The program is designed for juniors and seniors with a concentration in psychology or behavioral sciences and involves training in listening and helping skills.
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior

PSYC 488 Primatology Field Course 3 Credit Hours
This Primatology Field course will take students through an exploration of the scientific approach and methodology to the study of animal behavior. Students will gain experience in creating research projects and collecting data on free-ranging animals in a naturalistic environment. Preparation in lectures and activities on the campus of The University of Michigan-Dearborn will include learning about observational methods in detail, practicing developing ethograms and operational definitions, pilot data collection to modify the ethograms at the Detroit or Toledo Zoo, and use of GPS for data collection. Lecture materials will also cover topics of primate behavior and ecology. Students will spend a week observing a primate species (for example, one possible site for this field course may be to observe free-ranging lemurs at a reserve in Florida). Student’s data collection at the field site will be for five continuous days. This field course provides a unique opportunity to study rare and endangered primates species in a safe and accessible environment. Short day trips to other facilities are possible, such as a visit to an ape sanctuary. Topics covered in this field course include advanced observational methods stemming from the field of Ethology, practical development of ethograms (checksheets) and research design, best practices in GPS data collection methods, and collating and summarizing data on animal behavior into a research paper. Lecture topics will address ethological methods and research design and also how to conduct research with free-ranging nonhuman primates. In addition there will be a strong focus on health and safety precautions in the field for human and nonhuman primates, acclimation to the field site, and practicalities of data collection. For graduate credit on this course, extra journal articles and longer written papers required than for the undergraduate requirements.
Restriction(s):
Cannot enroll if Class is Freshman

PSYC 490 Advanced Topics in Psychology 3 Credit Hours
Examination of problems and issues in selected areas of psychology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

PSYC 492 Individual Research 1 to 3 Credit Hours
No more than 6 hours may be counted for concentration. Arrangements will be made for adequately prepared students to undertake individual research under the direction of a staff member. The students, in electing, should indicate the staff member with whom the work has been arranged. Students cannot receive credit for both PSYC 492 and PSYC 592. (YR).
Restriction(s):
Can enroll if Level is Undergraduate
PSYC 498 Psychology Honors Seminar 3 Credit Hours
Preparation for Honors research project. Involves discussion of and writing on: choosing a topic, reviewing the literature, selecting a research method and design, and developing a research proposal. (YR).

PSYC 499 Psychology Honors Research 3 Credit Hours
Participation with two faculty members in work leading to the honors thesis. This work involves active participation in research and will culminate in an independent research report, the honors thesis. Open only to psychology honors candidates. (F,W).

Prerequisite(s): PSYC 498

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F,W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Religious Studies (RELS)

RELS 120 Philosophy and Religion 3 Credit Hours
An examination of how basic concerns of philosophy impinge on questions of religious beliefs. Using philosophical texts, the course will explore such questions as the following: Does God exist? Does human life have a purpose? How can we know whether religious claims are true?

RELS 201 Religions of the World 3 Credit Hours
A study of religion in essence, in manifestation, and in relationship with the other dimensions of culture. Surveys major world religions.

RELS 313 African American Religions 3 Credit Hours
Full Title: African American Religious Experience This lecture course presents a survey of African American expressions across diverse religious traditions including Christianity, Islam, Judaism, Buddhism, and will explore contested forms of spiritual expression such as secularism and new religious movements. The course tracks these experiences from the late 18th to the 21st century in light of the contemporaneous context of social, political, and economic forces in the United States. No prerequisites. (YR)

RELS 327 Gods, Myth and Worship 3 Credit Hours
Full Course Title: Gods, Myth and Worship in Classical Art This course examines the way that gods, goddesses, heroes, and myths are depicted in Greek and Roman art, and how they were central to the religious and cultural life of these civilizations. We study the art, architecture, literature, and archaeology of ancient Greece and Rome as we explore how religious priorities, social needs, and political ideologies shaped the artistic choices behind the representations of deities and legendary figures and stories.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 105

RELS 329 Jesus and the Gospels 3 Credit Hours
Full Title: Jesus and the Gospels: Between Fact and Fiction Who was Jesus or Nazareth? For centuries people seeking an answer have turned to the four gospels of the New Testament. But how reliable are these texts? Were they written as biographies, histories, or to fulfill other purposes? This course will address these and other questions associated with the quest for the historical Jesus. Students will be introduced to a variety of approaches involved in the literaryhistorical study of the gospels and New Testament backgrounds and learn about the methods scholars employ to move from these texts and context. (S)

RELS 331 Early Christian Byzant Art 3 Credit Hours
Borrowing its formal language from late antiquity and its symbolism from other mystery cults, the art of early Christianity emerged from the Roman catacombs to monumental expression under emperors Constantine and Justinian. Special attention will be devoted to the invention of a new symbolic language in art and to the development of church architecture.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

RELS 332 The Reformation Era: 1500-1648 3 Credit Hours
A study of the nature, course, and impact of the Protestant Reformation in Europe, Humanism, the Counter-Reformation, and the cultural and social implications of Protestantism also receive attention. (YR).

RELS 333 Intro to Gospel Music 3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recording, videos, film, and at least one field experience. Underlying the course is the theory (Mellonie Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).
RELS 335  Women in Medieval Art  3 Credit Hours
Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women's roles in the creation and patronage of art and literature, economic and family issues, and women's participation in new and innovative forms of religious piety.

RELS 337  Islamic Movements Mid East Hist  3 Credit Hours
Will compare several Islamic movements in Middle Eastern history, starting with the rise of Islam in Mecca and Medina. Later impulses toward Islamic revival all looked back to the first movement, and hoped to capture both its spirit and its success. With this as background, the course will move to address two questions; How did later Islamic movements understand the history of the rise of Islam? How have later Islamic movements had to adapt their methods and their ideology to different historical circumstances? (AY).

RELS 338  Women & Islam in MidEast to 1900  3 Credit Hours
This course covers the historical development of Islam's normative stance towards women and gender roles in the Middle East from the rise of Islam to the earliest stirrings of feminist activism.

RELS 341  Religion and Literature  3 Credit Hours
An investigation of the ways in which religious ideas and practices have informed works of literature, and vice versa. Surveying a variety of genres and themes, the course will focus mainly on British and/or American literature and its engagement with Judaeo-Christian religion, though some attention may be devoted to other literary and religious traditions (e.g., ancient and medieval texts, European and world literature, Islam and Eastern religions).

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

RELS 346  Bible and Western Tradition  3 Credit Hours
A detailed study of major episodes from the Bible, first as a literary work, and second as it is reflected in both poetry and the visual arts during the Renaissance and Baroque periods. Included are selected works by such masters as John Donne, George Herbert, and John Milton in poetry and Michelangelo, Raphael, and Leonardo da Vinci in painting and sculpture.

RELS 349  Bible In/As Literature  3 Credit Hours
This course will study selected readings from the Bible, first in regard to their own literary, historical, and cultural contents, and then in regard to their reception, interpretation, and reapplication by later literary tradition. Biblical selections will cover both the Old and New Testaments as well as Apocryphal traditions, while reading from later non-biblical texts will be drawn from various literary periods.

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

RELS 355  Religion and Politics  3 Credit Hours
The primary focus of the course is on political movements or systems that take a religious form or have a religious base or use a religiously-rooted ideology. Possible themes or cases covered include the Catholic Church as a political system, Evangelical politics in America, religious uprisings, and Islamic political movements. (AY)

RELS 360  Myth, Magic, and Mind  3 Credit Hours
A broadly based introduction to the range of human mythical and magical traditions. Sophomore standing; ANTH 101 highly recommended. (YR).

RELS 363  Rel in Amer Hist:1607-1865  3 Credit Hours
A survey of the religious movements and trends in America from the 17th century to the Civil War, with emphasis on Puritanism, 18th-century revivalism, and 19th-century denominationalism and social reform. (AY).

RELS 364  Rel in Am Hist II:1865-Present  3 Credit Hours
A survey of American religion from the Civil War to the present, with emphasis on ethnicity and religion and post-World War II revivals of religion. (AY).

RELS 365  Introduction to the Qur'an  3 Credit Hours
This course is an introduction to the Qur'an. This class will cover the historical and the cultural factors in which the Qur'an appeared. The class will also examine some of the major themes covered in the Qur'an such as gender, science, pluralism, worldview and so forth. Also, will cover major schools of interpretations and methodologies ranging from the literary to the scientific. The class will be conducted in English and knowledge of Arabic is desired but not required. No prerequisites. The class will consist of lectures, discussions, and movies.

RELS 367  Religion and Resistance  3 Credit Hours
This course examines how religion and spirituality as cultural form has been instrumental in influencing social, political, and economic thought and the action of violent and nonviolent resistance. In such, African Americans have affirmed their humanity, their citizenship, and have exerted mechanisms of protest and change that have in-kind influenced similar thought and activity around the globe. When contemporary students are aware of this history at all, it is often without the knowledge or understanding of the various forms of resistance and the range of reason and spirituality behind this activity. The course will present key figures from within this range (AY).

RELS 373  Bible in History  3 Credit Hours
In this course we will try to examine the historical circumstances and contexts surrounding the writing of The Hebrew Bible. Roughly speaking, we will begin by exploring three aspects of the subject: Historical context of the writing of the Bible-i.e. during the organizing and communicating of each segment. History of the canonization: the ideas and rationale behind including some books but not others. History in the Bible. In more specific terms, this will entail examining who wrote the Bible, when and why. The narrative incorporates the movement from an oral tradition to a written one and will demand some focus on certain pivotal moments, e.g., Ezra’s reading (cf. Ezra-Nehemiah), or the historical events in Kings and Chronicles, or the defeat of the northern kingdom of Israel in 722 B.C.E. (BC) and of the southern kingdom of Judah in 589 B.C.E.
RELS 384  Islamic Decorative Arts  3 Credit Hours
This course in an in-depth investigation of the decorative arts of the Islamic Middle East from the seventh through the eighteenth century including the lands of Islamic Spain and North Africa and extending east to Afghanistan. The course traces the development of decorative styles in objects of daily and courtly life, particularly ceramics, metal work, glass, wood and ivory carving, textiles and rugs. The central role played by calligraphy in all of the arts in emphasized as well as in manuscript production and the Arts of the Book. As a religion, but also a way of life, Islam fostered a distinctive artistic production reflected in these decorative arts.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106 or HUM 201 or RELS 201

RELS 385  Philosophy of Religion  3 Credit Hours
A philosophical examination of basic religious problems, such as the nature and grounds of religious belief, the existence and nature of God, human immortality, the relations of religion and science, and the nature or religious language. Students electing this course must have successfully completed a previous course in philosophy or have permission of the instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 365 or PHIL 340 or PHIL 355 or PHIL 350 or PHIL 369 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490 or RELS 120

RELS 390  Topics in Religious Studies  3 Credit Hours
Examination of problems and issues in selected areas of religious studies. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Junior standing required.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

RELS 393  Black Women, Rel & Spirituality  3 Credit Hours
This lecture course surveys descriptive and critical literature relevant to the religious and spiritual experience and thought of African diasporic women. Studying religiosity and spirituality among this population helps students understand this influential, culturally-constructed world view of Black women as they engage in a variety of institutions including healthcare, economic activity, the criminal justice system, politics, and social relationships. The course gives particular attention to Black feminist and Womanist literature on these topics. (AY)
Restriction(s):
Cannot enroll if Class is Freshman

RELS 401  Religion in Contemp US Culture  3 Credit Hours
The purpose of this course is to provide people in contemporary multi-religious America foundational information about beliefs and practices of several of the world’s religions sufficient to engage in inter-religious dialogue. Special emphasis will be given to changes the American religious landscape after 1965 with the passage of new immigration laws. The course will combine lectures and visits to a variety of Metropolitan Detroit religious centers including Hindu, Buddhist, Jain, Sikh, Jewish, Christian, Muslim, and Native American. (S).

RELS 404  Medieval Mystical Writers  3 Credit Hours
A study of the genre of mystical writing as it was developed and practiced throughout the Middle Ages and in 14th century England particularly. Attention will be given to the historical, religious, and cultural contexts that enabled and were created by mystical texts. In addition, the course will explore how traditional and contemporary trends in the fields of religious and literary studies can be brought to bear on the genre of mystical writing. (OC)
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

RELS 440  Religion and Culture  3 Credit Hours
An introduction to the comparative study of religious systems. Explores religious beliefs and practices in non-Western cultures; surveys theoretical approaches to the study of religion; and discusses how religions grow, develop, and change. ANTH 101 recommended. (YR).

RELS 455  Sociology of Religion  3 Credit Hours
Religion as a social institution; its purposes, methods, structure, and beliefs, and its relation to other institutions.
Prerequisite(s): SOC 200 or SOC 201

RELS 498  Independent Study  3 Credit Hours
This course provides an opportunity for qualified students interested in Religious Studies to pursue independent research under the direction of a qualified faculty member. The project must be defined in advance, in writing, and must be a topic not currently offered in the regular curriculum.
Prerequisite(s): HUM 201 or PHIL 120
Restriction(s):
Can enroll if Class is Junior or Senior
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Science and Technology Studies (STS)

STS 300  Intro to Sci & Technol Studies  3 Credit Hours
An examination of the social contexts and consequences of science and technology, with special attention to the impacts of the automobile and automobile industry on American society. Topics include the automobile’s role in the history of manufacturing; the impact of various production techniques on work and workers; the effects of the automobile on the natural environment, the design of cities and development of suburbs, and ways of life; the iconic status of the car in American culture and the relationship between automobile design and aesthetics. (YR).

STS 301  Concepts of Environmentalism  3 Credit Hours
Designed to identify the underlying concepts of any environmental issue. The course will demonstrate the interdisciplinary nature of environmental problem-solving through current readings, classical monographs, and films. Students will conduct a systems analysis of a household and a local community. A major research paper on an environmental topic will be required. The course will not be open to students who take ENST 105. (YR).
STS 305  Social Issues in Auto Design  3 Credit Hours
An examination of the impact of four contemporary social issues - vehicle safety, energy consumption, environmental impact, and a changing workforce - on the design and engineering of automobiles in the context of globalization and rapid technological change. Using a series of case studies, the course will focus on the ways social concerns, government regulation, and professional ethics, as well as industry standards and technical considerations, affect the decision-making processes of automobile designers and engineers. (OC).
Prerequisite(s): COMP 105 or COMP 110 or Composition Placement Score with a score of 30

STS 308  Urban Geography  3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges, such as sprawl, pollution, congestion, crime, poverty, etc., are addressed. (F,W).

STS 309  Economic Geography  3 Credit Hours
Spatial aspects of the ways people make their living. Discussion of the spatial distribution of resources and wealth at various scales. Introduction of site selection and location analysis. (F).

STS 310  Computers and Society  3 Credit Hours
A sociological discussion of computers and other information technology starting with the larger concept of technology and social change, an exploration of various forms of information technology, their history and development, their relationship to the changing social structure of a post-industrial society like 20th/21st-century USA. Case studies could include "Computers and the Workplace," "Computers in Medicine," "Computers and Education," and "Computers in Popular Culture." Course concludes with a discussion of new social problems and possible futures. (OC).
Prerequisite(s): SOC 200 or SOC 201

STS 312  Environmental Ethics  3 Credit Hours
An introduction to the study of human ecology. This course employs the case-study method to develop an evolutionary and biocultural perspective on the relationship between human beings and their environments. (OC).

STS 349  Thomas Edison and His Era  3 Credit Hours
This course will introduce students to the life and work of Thomas Edison. Breaking with the stereotype of the lone inventor/genius, we will examine how Edison helped shape and was in turn shaped by the context of the Gilded Age America when the United States emerged as an urban, industrial nation. Lectures and discussions will be supplemented by slides, films, and visits to the Edison-related sites at the Henry Ford. Throughout the course the following themes will be explored: invention and the labor process, the significance of manufacturing and marketing, the origins of modern consumer culture. (OC).

STS 365  Environmental Psychology  3 Credit Hours
A survey of the contributions of the behavioral sciences to the understanding and solution of environmental problems that threaten our survival. Insights derived from psychology, anthropology, and computer science are discussed. Major topics include overpopulation, overconsumption of resources and energy, future shock, cognitive limitations in our understanding of ecological-political systems, and the use of behavioral control. (OC).
Prerequisite(s): PSYC 170 or PSYC 171

STS 366  Henry Ford and His Place  3 Credit Hours
Using the biography of Henry Ford as a touchstone, the course will examine the trajectories of historical change and regional development between 1870 and 1950. Of fundamental concern will be southeastern Michigan's transformation from a 19th century outpost on the Great Lakes to the nation's "engine of change" in the 20th century. Henry Ford was the major player in that revolutionary transformation. This course examines his role in history and mythology as well as the causes and implications of that transformation. (OC).
ST374  History of Industrial Technology  3 Credit Hours
Focusing on western Europe and the United States since the Industrial Revolution, this course will examine the history of manufacturing technologies and will include the following topics: mechanization and the rise of the factory; mass production; the process of innovation; design and diffusion of new technologies; technologies; technology and the changing nature of work; discussions, and examination of artifacts (actual tools and machines), students will consider the central role played by technology in the making of modern society. (YR).

ST383  Labor in America  3 Credit Hours
A survey of urban workers from colonial times to the present. Among the topics covered are changing standards of living, the experiences of industrial work, labor organizations, and working-class politics. (OC).

ST386  Comparative History of Technology  3 Credit Hours
This course will examine the history of technology from a comparative perspective; studying the development and impact of technology in different societies during various historical eras. Topics include: irrigation control and the rise of ancient empires; technology’s role in the industrial revolution; technological innovation and the pace of social change. Current issues and various analytical perspectives in the history of technology will also be examined. (OC).

ST390  Topics in STS  3 Credit Hours
Examination of problems and issues in selected areas of Science and Technology Studies. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

ST401  Economics of the Labor Sector  3 Credit Hours
Theoretical analysis and empirical studies of the nature and operation of labor markets. Includes theories of wage determination and income distribution, the nature of unemployment, the impact of collective bargaining on the economy, the extent and economic effects of discrimination, and the nature and effects of government wage and employment policies. ECON 321/STS 321, Labor in the American Economy, is valuable background to this course although it is not a prerequisite. This course counts as a required capstone (4000-level) course in Economics and also counts toward the Economics Honors designation.

Prerequisite(s): ECON 302

ST403  Issues in Cyberspace  3 Credit Hours
This course will explore some of the social, political, legal, and technological issues associated with the use of new media technology to move ideas and information in a democratic society. Examples of areas to be explored include the Internet and World Wide Web, privacy, the future of the mass audience, and the meaning of the First Amendment in the 21st Century. (AY).

Prerequisite(s): COMM 280

ST409  Human Body, Growth & Health  3 Credit Hours
This course provides advanced undergraduate introduction to the topic of human growth and shows how human growth can be a reliable measure of the psychological, social, economic and moral conditions of a society. A major theme will be the interplay of biology and culture in shaping the patterns of human growth and, consequently, the health of populations and individuals. (OC).

ST410  Darwinism and Philosophy  3 Credit Hours
Darwinism represents a challenge to the traditional view of human life as radically separate from the rest of the natural world. This course will examine the philosophical implications of this world view. It will address questions such as these: Is Darwinism compatible with traditional religion? Does Darwinism imply that human life and the cosmos are without purpose? Can human life be meaningful if it is the result of evolution and natural selection? Does Darwinism require us to change our view of nature? What are the ethical implications of a Darwinian view of life and the universe? (OC).

Prerequisite(s): PHIL 100 or PHIL 210 or PHIL 200 or PHIL 233 or PHIL 240

Restriction(s): Cannot enroll if Class is

ST430  Medical Anthropology  3 Credit Hours
A comprehensive examination of how culture mediates processes of illinesses and healing. Comparative materials examined, which provide a context for an anthropological analysis of modern biomedicine. (YR).

ST442  Sociology of Work  3 Credit Hours
The study of work roles in modern society. The impact of industrialization, professionalization, and unemployment on the conditions of work, worker motivation, and job satisfaction. Career choice processes and career patterns, occupational status and prestige, and occupations associations are among the topics to be considered. (YR).

Prerequisite(s): SOC 200 or SOC 201

ST464  Applied Cognitive Psychology  3 Credit Hours
The focus will be on the application of the principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language.

Prerequisite(s): PSYC 170 or PSYC 171

ST485  Philosophy of Science  3 Credit Hours
A critical study of the foundations of the sciences, natural and social, with emphasis on the following topics: the nature of scientific method, theories and explanation, probability and determinism, the unity of the sciences. (OC).

Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 200 or PHIL 233 or PHIL 240

ST488  Env Lit & Reps of Nature  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between “nature” and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th and 20th centuries, but assigned materials may include readings from other cultures and historical periods. (OC).

Prerequisite(s): (COMP 106 or COMP 220 or COMP 280 or Composition Placement Score with a score of 40 or COMP 270) and (ENGL 230 or ENGL 231)

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Social Sciences (SSCI)

SSCI 236  Sid-Comm Org for Environ Just  3 Credit Hours
Full Title: Sem in Detroit: Community Organizing for Environmental Justice. This course serves as an elective course for the Semester in Detroit (SiD) program. This course looks at movements, resistance, resilience, and liberation as it pertains to environmental justice. A growing body of evidence reveals that people of color and low-income persons have borne greater environmental and health risks than the society at large in their neighborhood, workplace, and playgrounds. We will connect history, current events, and real-life experiences to local organizing and movement struggles that build power for our communities. We will utilize highly interactive popular education methods where participants share political analysis, learn facilitation and organizing skills, and think together about long-term, transformative strategies to build environmental, racial and economic justice.

SSCI 302  SiD-Intern Seminar  2 Credit Hours
Full Title: Semester in Detroit: Internship Reflection Seminar This course serves as a core course for the Semester in Detroit (SiD) program. The primary purpose of this class is to provide a supportive, yet challenging learning space for reflecting on your Detroit internship experiences this semester. There are three main sources of material for this class: you, the internship, and Detroit. While, in theory, each is distinct, in practice, all three are interwined and interact and affect one another. Your challenge will be learning to see more clearly the interactions among these domains. Students must apply to, and be accepted by UM-Ann Arbor's Semester in Detroit program to enroll in this course.
Corequisite(s): URS 301

SSCI 390  Topics in Social Sciences  1 to 3 Credit Hours
Examination of problems and issues in selected areas of social science. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when the specific topic differs. (OC)
Restriction(s):
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Sociology (SOC)

SOC 200  Understanding Society  3 Credit Hours
An introduction to the study of human groups with special attention devoted to an analysis of contemporary American society. (F,W).
SOC 306  Comparat. American Identities  3 Credit Hours  
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic, and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity, and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience. 
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280 
Restriction(s):  
Can enroll if Level is Undergraduate 

SOC 308  Sociological Theory  3 Credit Hours  
A historical survey of the major theorists and their works from the beginnings of sociological positivism to contemporary theories. (YR).  
Prerequisite(s): SOC 200 or SOC 201 

SOC 309  Introduction to Law & Society  3 Credit Hours  
Law and Society is a field of study that examines the interaction between the legal system and society from the perspective of the social sciences and humanities. This course focuses on core components of the legal system including courts, lawmaking bodies, regulatory administration, alternative dispute resolution systems, and the legal profession. Throughout the course, students develop the ability to examine the legal system and its relationship to equality, social change, and public benefits using social science evidence. (YR)  
Restriction(s):  
Cannot enroll if Class is Freshman  

SOC 310  Computers and Society  3 Credit Hours  
A sociological discussion of computers and other information technology. Starting with the larger context of technology and social change, an exploration of various forms of information technology, their history and development, their relationship to the changing social structure of a post-industrial society like 20th/21st century USA. Case studies could include "Computers and the Workplace," "Computers in Medicine," "Computers and Education," and "Computers in Popular Culture." Course concludes with a discussion of new social problems and possible futures. (YR).  
Prerequisite(s): SOC 200 or SOC 201 

SOC 350  Poverty and Inequality  3 Credit Hours  
In a middle class-oriented culture, the poor experience many problems and are also considered deviant which tend to make poverty self-perpetuating. This stratum will be explored with respect to life styles, life changes, contributing factors, characteristics, individual and social consequences, and evaluation of attempted solutions. (YR).  
Prerequisite(s): SOC 200 or SOC 201 

SOC 362  Social Life in Science Fiction  3 Credit Hours  
This course focuses on the sociological analysis of social life depicted in contemporary and popular science fiction texts and films. The course examine the impact and consequences of different modes of social reproduction and family relations, social structure and organization, social inequality and stratification, social relations and conflicts, social mores, values and scenarios of dystopia. Through studying science fiction, students gain insight in our present's society's hopes, dreams, anxieties, and fears about future social relations, the environment and humanity. (W)  
Prerequisite(s): SOC 200 or SOC 201  

SOC 366  Sexualities, Genders, & Bodies  3 Credit Hours  
This course introduces key questions and debates in lesbian, gay, bisexual, transgender, and queer studies. Through engagement with multidisciplinary sources, students explore how sexualities, genders, and bodies are constructed and contested, how these constructions vary in diverse contexts and historical moments, and what gaps remain in our knowledge of LGBTQ lives. (YR)  

SOC 382  Social Psychology  3 Credit Hours  
An introductory study of the interrelations of the functioning of social systems and the behavior and attitudes of individuals. (YR).  
Prerequisite(s): SOC 200 or PSYC 170 or PSYC 171 or SOC 201 or PSYC 101  

SOC 388  LGBTQ Religious Experience  3 Credit Hours  
This course explores intersections of religion, spirituality, and faith with sexuality and gender. Christianity and Islam receive particular attention. We also examine Lesbian, Gay, Bisexual, Transgender and Queer (LGBTQ) journeys within Buddhism, Hinduism, Judaism, new spiritual movements, and interfaith work. The course highlights intersections at three levels of analysis: the individual or personal level (how do LGBTQ identities intersect and interact with religious freedom and practice?), the interactional or community level (how do LGBTQ people experience belonging and rejection in diverse faith communities?) and the institutional level (how do the structures of these belief systems shape the life chances of LGBTQ people in society?). (W,S,AY)  

SOC 390  Topics in Sociology  3 Credit Hours  
Examination of problems and issues in selected areas of sociology. Title in Schedule of Classes will change according to course content. Course may be repeated for credit when specific topics differ. (F,W).  

SOC 398  Directed Readings  1 to 3 Credit Hours  
Reading assignments in sociology. No more than a total of six credit hours of SOC 398 and SOC 498 may be applied toward concentration. Permission of instructor required. (F,W,S).  
Prerequisite(s): SOC 200 or SOC 201  

SOC 403  Minority Groups  3 Credit Hours  
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. Students cannot receive credit for both SOC 403 and SOC 503. (F,W).  
Prerequisite(s): SOC 200 or SOC 201  

SOC 4045  Dissed: Differ, Power, Discrim  3 Credit Hours  
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic, and political - in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a 'natural order', obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors, and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both SOC 404 and SOC 504.  
Restriction(s):  
Can enroll if Class is Freshman or Sophomore or Junior or Senior  
Can enroll if Level is Undergraduate
SOC 409 Feminist Theories 3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women's and men's lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Student will not receive credit of both SOC 409 and SOC 509. (AY)
Prerequisite(s): SOC 308 or SOC 303 or ANTH 303 or PSYC 275 or SOC 275 or SOC 200 or SOC 201 or PSYC 275 or SOC 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

SOC 410 Quantitative Research & Stats 4 Credit Hours
An introduction to methods of data collection and analysis. Elementary statistics data are analyzed using computerized statistics programs. A discussion of research design and the philosophy of social science is also included. Students cannot receive credit for both SOC 410 and SOC 510. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 411 Program Evaluation 3 Credit Hours
The application of social research procedures in assessing whether a human service program is needed, likely to be used, conducted as planned, and actually helps people in need. The course will cover research design and measurement as well as issues of how to get research findings utilized. Students cannot receive credit for both SOC 411 and SOC 511. (YR).
Prerequisite(s): SOC 200 or PSYC 170 or PSYC 171 or POL 101 or SOC 201 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

SOC 412 Men and Masculinities 3 Credit Hours
This course addresses the question, "What is a man?", in various historical, cross-cultural, and contemporary contexts. A major focus on the social and cultural factors that underlie and shape conceptions of manhood and masculinity in America as well as in a variety of societies around the globe. (AY).
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

SOC 413 Qualitative Research 3 Credit Hours
Qualitative research methods involve the observation and study of people in their everyday lives, in their taken-for-granted worlds. Qualitative research seeks to combine close empirical observation with analytic techniques that demand (and teach) personal and social self-consciousness as necessary to an understanding of the social worlds of others. This course in qualitative methods is designed to acquaint students with field research theories and techniques. Students will gain hands on experience in participant observation, interviewing and the use of sociological scholarship. Qualitative Research Methods will prepare students to gather data, focus the data in a social scientific manner, analyze the data, and then organize it in reportable form.
Prerequisite(s): SOC 308

SOC 423 American Social Classes 3 Credit Hours
Stratification of American communities and society; a review of the findings of major studies and an introduction to methodology. Students cannot receive credit for both SOC 423 and SOC 523. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 426 Society and Aging 3 Credit Hours
Personal, interpersonal, and institutional significance of aging and age categories. Sociological dimension of aging based on social, psychological, and demographic factors. Attention to social networks and institutionalization. Students cannot receive credit for both SOC 426 and SOC 526. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 430 Population Problems 3 Credit Hours
Social causes and consequences of population structure and change. How variations in fertility, mortality, and migration arise and how they affect society. Illustrations from the United States and a variety of developed and underdeveloped countries. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 433 Race/Ethnic Health 3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequality-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy interventions. (OC)

SOC 435 Urban Sociology 3 Credit Hours
A descriptive study of the form and development of the urban community with respect to demographic structure, spatial and temporal patterns, and functional organization. The relationship of city and hinterland. Social planning and its problems in the urban community. Students cannot receive credit for both SOC 435 and SOC 535. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 440 Medical Sociology 3 Credit Hours
An analysis of health and illness behavior from the point of view of the consumer, as well as of medical professionals, the structure, strengths, and weaknesses of the medical care delivery system in the U.S.; the impact of culture and personality on illness behavior; and a study of the institution of medicine and activities of health care professionals. Students cannot receive credit for both SOC 440 and SOC 540. (F,S)
Prerequisite(s): SOC 200 or SOC 201

SOC 442 Sociology of Work 3 Credit Hours
Study of work roles in modern society. The impact of industrialization, professionalization, and unionization on the conditions of work, worker motivation, and job satisfaction. Career choice processes and career patterns, occupational status and prestige, and occupational associations are among the topics considered. Students cannot receive credit for both SOC 442 and SOC 542. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
SOC 443  Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Students cannot receive credit for both SOC 443 and SOC 543. (F,W,S).
Prerequisite(s): SOC 200 or PSYC 170 or PSYC 171 or SOC 201 or PSYC 101

SOC 445  The Family  3 Credit Hours
The family as an institution shaped by other aspects of society, as a social system with its own dynamics, and as a primary group affecting the lives of its members. Historical and contemporary materials from the United States and other cultures. Students cannot receive credit for both SOC 445 and SOC 545. (F,W,S).
Prerequisite(s): SOC 200 or SOC 201

SOC 446  Marriage and Family Problems  3 Credit Hours
Sociological analysis of problems encountered within the institution of marriage with particular reference to such issues as choosing a marriage partner, sexual adjustment, occupational involvement, conflict resolution, child rearing, divorce and readjustment. Students cannot receive credit for both SOC 446 and SOC 546. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 447  Family Violence  3 Credit Hours
Sociological analyses of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering, and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Students cannot receive credit for both SOC 447 and SOC 547. (YR)
Prerequisite(s): SOC 200 or SOC 301 or SOC 443 or PSYC 405 or WST 405 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 448  Comparative Health Care Sys  3 Credit Hours
An introduction and overview of the English, Swedish and People's Republic of China health care systems. Focus on cultural context and other organizational characteristics, unique features, approaches and ability to solve problems. Emphasis on how the three systems help us understand the American health care system. Students cannot receive credit for both SOC 448 and SOC 548. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 449  Black Family in Contemp Amer  3 Credit Hours
The African-American family is examined in relationship to the historical and contemporary forces that have shaped its characteristic patterns of family life. These forces include the influence of slavery, urbanization, racial discrimination and urban poverty. The patterns of family life include parental roles, family structure, kinship relations, and gender roles. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 450  Political Sociology  3 Credit Hours
Examines how society effects the distribution and exercise of power through analyzing linkages between power, participation, and perspectives. Studies of political participation and social organization, ideology and social conflict, as well as political socialization, represent some of the major parameters. Students cannot receive credit for both SOC 450 and SOC 550. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 451  Family, Sexuality, Rights  3 Credit Hours
Full Course Title: Family, Sexuality, and Human Rights in a Changing World. This course investigates the changing possibilities for forming families and expressing sexuality, with a focus on how nation states and legal and cultural systems construct and respond to these changes. Selected topics include the meanings of sex, love, marriage, and relatedness in different historical moments; struggles for recognition of varied kinship and family arrangements, such as interracial, interfaith, same-sex, polygamous and multi-partner relationships; and new technologies and their implications for family life. (YR)
Prerequisite(s): (WGST 303 or SOC 303 or ANTH 303 or PSYC 303 or HUM 303) or (SOC 200 or SOC 201) or (ANTH 101 or ANTH 202)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

SOC 452  Marxism  3 Credit Hours
This survey of Marxist and neo-Marxist thought discusses philosophy, economic history, and socialism. Topics include Marx's view of the nature of man, class conflict, the dialectic in history, the labor theory of value, monopoly capital and imperialism. Problems of socialist societies such as economic development and rule of elites will also be discussed. (AY).
Prerequisite(s): SOC 200 or POL 101 or ECON 201 or ECON 202 or SOC 201

SOC 453  Sociology of Law  3 Credit Hours
Various aspects of the relationship between law and society are explored. After a look at processes of law making, attention is turned to the administration of law. This involves a study of the activities of legislatures, courts, police, and correctional agents. Students cannot receive credit for both SOC 453 and SOC 553. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 454  Mental Health and the Law  3 Credit Hours
Courts and legislatures now control much of the work of mental health professionals such as social workers, counselors, therapists, and psychologists. This course looks at problems encountered in putting the laws and policies into effect. These implementation problems are much the same in other areas of government action, such as poverty programs and pollution control. Students cannot receive credit for both SOC 454 and SOC 554. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 455  Sociology of Religion  3 Credit Hours
Religion as a social institution; its purposes, methods, structure, and beliefs, and its relation to other institutions. Students cannot receive credit for both SOC 455 and SOC 555. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
SOC 455   Immigrant Cultures and Gender   3 Credit Hours
The history and culture of immigration since 1850, including (1) formation and perseverence of immigrant communities and interethnic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles.
Prerequisite(s): ANTH 101 or WGST 303 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 456   Health Care and the Law   3 Credit Hours
A sociological study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children's rights, access to health care. The emphasis will be on the organizational and personal consequences of legal requirements. Junior/Senior standing is a requirement. Students cannot receive credit for both SOC 456 and SOC 556. (AY)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

SOC 457   Family, Aging and the Law   3 Credit Hours
The law exerts a powerful impact on the family and the elderly. This course interprets the effects of laws concerning guardianship, competence, nursing home regulation, marriage, divorce, custody, adoption, abortion, and child sexual abuse.
Prerequisite(s): SOC 200 or SOC 201

SOC 458   Sociology of Education   3 Credit Hours
Education as a social institution; its purposes, methods, structure, and philosophy, and its relation to other institutions, particularly in the urban setting. Students cannot receive credit for both SOC 458 and SOC 558. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 460   America in a Global Society   3 Credit Hours
Social changes in America are studied from an internal and an external perspective. The internal dynamics of social change emphasize the role of social movement, e.g., the impact of the civil rights movement on American culture and politics. The external perspective sees America as part of a changing global society. The development of the capitalist world system from its origin in Western Europe to its present global reach is examined. Contemporary American social problems are examined in relation to America's position in a rapidly changing world. Students cannot receive credit for both SOC 460 and SOC 560. (AY)
Prerequisite(s): SOC 200 or SOC 201

SOC 461   Cops & Cons: Women in Prison   3 Credit Hours
Course uses contemporary theories of gendered organizations to frame analyses of prison policies and practices in employment and incarceration as they reflect and reproduce gender inequalities. Analyses will be framed within a restorative justice model, that is, a critique of the current criminal justice system of retributive justice and a paradigm of what a alternative system could be.
Prerequisite(s): SOC 200 or SOC 201 or WST 275 or WGST 275 or CRJ 240 or CRJ 300 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 465   Deviant Behavior/Soc Disorganz   3 Credit Hours
A general analysis of the concept of social deviance and social disorganization: factors producing each condition, the effects of social control measures on the course of deviance and disorganization consequences for the social system, and the relationship between the two. Students cannot receive credit for both SOC 465 and SOC 565. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 466   Drugs, Alcohol, and Society   3 Credit Hours
Analyses of the sociology of substance use and abuse. Provides a sociological framework for understanding issues and evaluating our nation’s responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American society. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 467   Drugs, Crime, and Justice   3 Credit Hours
Provides a comprehensive analysis of the current state of research on interactions between crime and drug use. Examines drug distribution, organization of drug systems, and mechanisms of social control of drug systems. Analyzes the social problems associated with drugs and crime. The course also focuses on drug-law enforcement and public policy strategies for dealing with drugs and crime. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 468   Race, Crime and Justice   3 Credit Hours
This course is an analysis of race and its relation to crime in the criminal justice system. Students will analyze and interpret the perceived connection between race and crime, while exploring the dynamics of race, crime, and justice in the United States. This course is designed to familiarize students with current research and theories of racial discrimination within America's criminal justice system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman
SOC 475  Soc Construct Mental Illness  3 Credit Hours
Diversity Issues in Mental Health explores varied cultural descriptions and models of mental illness. By focusing on the ways that culture shapes how people experience, and respond to, mental illness this class explores cultural representations of mental illness, ranging from discrete illness resulting from a chemical imbalance to a profound threat to order. We seek to understand the cultural, personal, and political underpinnings of mental illness and medical practices in societies throughout the world. The course utilizes an interdisciplinary perspective, drawing from multiple sources of information regarding mental health issues, including feminism, psychiatry, history, sociology, and literature. Issues raised throughout the course include the ways gender, race, culture, religion, and stigma influence the diagnosis of mental illness, patterns of help-seeking behavior, formation of comprehensive mental health policy, and treatment options.  
Prerequisite(s): SOC 200 or SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303  
Restriction(s): Cannot enroll if Class is Freshman or Sophomore

SOC 476  Inside Out Prison Exchange  4 Credit Hours
This community-based course, taught in a local correctional facility, brings university students and incarcerated students together to study as peers. Together students explore issues of crime and justice, drawing on one another to create a deeper understanding of how these issues affect our lives as individuals and as a society. The course creates a dynamic partnership between UMD and a correctional facility to allow students to question approaches to issues of crime and justice in order to build a safer and more just society for all. The course encourages outside (UMD) students to contextualize and to think deeply about what they have learned about crime and criminals and to help them pursue the work of creating a restorative criminal justice system; it challenges inside students to place their life experiences into larger social contexts and to rekindle their intellectual self-confidence and interest in further education.  
Restriction(s): Can enroll if Class is Junior or Senior

SOC 477  Social Welfare  3 Credit Hours
The practice of social work is examined within the context of the development of the social service professions and welfare institutions in American society. Social welfare is a concept that encompasses the provision of material resources, as well as regulation and protection of clients. Changes in welfare policy are analyzed in relationship to other institutional changes in American society. (YR).  
Prerequisite(s): SOC 200 or SOC 201

SOC 478  Social Work Internship  3 to 6 Credit Hours
Provides field experience in social welfare or criminal justice agencies, e.g., for children/adolescents, in residential programs, in abuse remediation, in probation, for chemical dependencies, in victim advocacy, for elderly, in prisons, for special needs populations, in court services, and for families and communities. Supervision by approved field instructors. An internship of 80 hours is required for three (3) credits. Instructor and student will work together to determine appropriate intern placement. Approval of instructor is required. (OC).  
Prerequisite(s): SOC 200 or SOC 201

SOC 479  Comparative Hlth Systems:Trip  3 Credit Hours
A unique combination of lectures, field trips, visits with general practitioners, specialists, hospital observations, talks with health policy planners, researchers, and many others. Personal experience in two health care systems. Permission of instructor. Junior/Senior standing required. Students cannot receive credit for both SOC 479 and SOC 579. (AY).  
Prerequisite(s): SOC 200 or SOC 201  
Restriction(s): Can enroll if Class is Junior or Senior

SOC 481  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women’s lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women’s movements, this course explores how globalization reformulates identities and locations and the political possibilities they create. (AY).  
Prerequisite(s): ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303  
Restriction(s): Cannot enroll if Class is Freshman or Sophomore  
Can enroll if Level is Undergraduate  
Can enroll if College is Arts, Sciences, and Letters

SOC 482  Methods of Social Work Pract  3 Credit Hours
Examination of social work practice methods and approaches to social problems, contexts of practice and targets of change. Focus is on knowledge and skills each practice method requires to effect personal and social change. (YR).  
Prerequisite(s): SOC 200 or SOC 201

SOC 483  Images of Organizations  3 Credit Hours
Formal bureaucratic organizations such as government agencies, hospitals, and colleges are a distinctive feature of modern industrialized societies. Analysis of types of formal organizations, their goals, structure, and consequences for intra- and inter-organizational behavior helps to understand how to deal with a complex world. Students cannot receive credit for both SOC 483 and SOC 583. (YR).  
Prerequisite(s): SOC 200 or SOC 201  
Restriction(s): Can enroll if Level is Undergraduate
**SOC 484 Violence Against Women  3 Credit Hours**
Course examines local and global social violence against women outside family and other intimate relationships. Students consider violations against women's human rights through the life cycle, which are often sanctioned under the guise of cultural practices and misinterpretations of religious tenets. Topics include sex-selective abortion and female infanticide (the "missing millions"); female genital mutilation and cosmetic surgeries; prostitution and pornography; trafficking in women; sexual harassment; and women's experiences of war as soldiers, non-combatants and refugees. Topics are "paired", that is, students compare understandings of Western and non-Western social practices related to gender. Students examine both institutionalized sexism and racism, as part of political, economic, and social systems, and sexism and racism as realities affecting individual women's lives.
**Prerequisite(s):** SOC 200 or SOC 201 or WGST 303 or HUM 303 or PSYC 303 or ANTH 303 or SOC 303 or WGST 375 or HUM 275 or PSYC 275 or SOC 275 or ANTH 275 or WST 275
**Restriction(s):**
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

**SOC 490 Advanced Topics in Sociology  3 Credit Hours**
Examination of problems and issues in selected areas of sociology. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs.

**SOC 490A Advanced Topics in Sociology  3 Credit Hours**
**TOPIC:** Diasporas and (Trans) Nationalism: Gender, Race, and Post-Coloniality. An interdisciplinary and comparative inquiry into historical & contemporary linkages between gender regimes, national formations, and legacies of colonialism as they interact at "home" and in "diasporas." Using multi-media and multi-genre pedagogical tools (conceptual and methodological writings; narratives and biographies; guest lectures; films), we study & critique different perspectives on how the dialectics of geography, positionality, and social structures shape the ways in which we imagine "home", "homeland", and "back home." We examine gendered politics of the colonial project 1) in early days of colonialization; 2) during struggles of decolonization; and 3) "post-colonial" geographies'. While becoming familiar with "classics" in nationalism/transnationalism, gender, colonialism, and diaspora, we will explore their applicability to specific case studies in European and American contexts as well as in Africa, Asia, and the Middle East.

**SOC 497 Senior Research Seminar  3 Credit Hours**
This course is intended as the culmination of a student's prior work in sociology. Each student will conduct an applied research project that draws upon sociological concepts and issues. The product of this research will be an essential component of the student's concentration portfolio.

**Prerequisite(s):** SOC 410

**SOC 498 Independent Study  1 to 3 Credit Hours**
Analytical assignments in sociology. No more than a total of six credit hours of SOC 398 and SOC 498 may be applied toward concentration. Permission of instructor required. (F,W,S).

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Spanish (SPAN)**

**SPAN 101 Spanish Language & Culture I  4 Credit Hours**
Full Course Title: Introduction to Spanish Language and Culture I-First course in the two-course elementary Spanish sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in Hispanic culture. (F.S).

**SPAN 102 Spanish Language & Culture II  4 Credit Hours**
Full Course Title: Introduction to Spanish Language and Culture II-Second course in the two-course elementary Spanish sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, and writing. (F,W,S).

**Prerequisite(s):** SPAN 101 or Spanish Language Placement with a score of 102 or Spanish Language Placement with a score of 201 or Spanish Language Placement with a score of 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

**SPAN 201 Intermediate Spanish I  4 Credit Hours**
An intermediate-level course designed to increase the proficiency in listening, speaking, reading, and writing within a cultural context. Emphasis is placed on acquiring new vocabulary and expanding the use of grammar structures. Course materials promote the use of language to communicate with others and to function in Hispanic culture. (F).

**Prerequisite(s):** SPAN 102 or Spanish Language Placement with a score of 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302 or Spanish Language Placement with a score of 302

**SPAN 202 Intermediate Spanish II  4 Credit Hours**
Continuation of SPAN 201 with emphasis on the development of all language skills. (W).

**Prerequisite(s):** SPAN 201 or Spanish Language Placement with a score of 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

**SPAN 254 Spanish Conversation  2 Credit Hours**
This course provides extensive oral practice to reinforce vocabulary and grammar concepts and to improve pronunciation. Conversational skills are developed through discussion and use of communicative exercises, activities, and games. (OC).

**Prerequisite(s):** SPAN 102

**SPAN 301 Adv Conversation and Comp I  3 Credit Hours**
An advanced course in conversation, composition, and syntax designed to strengthen existing skills. An intensive review of grammar combined with pronunciation and vocabulary exercises should enable the student to make progress in composition and conversation. Oral and written assignments will be based on readings from contemporary sources. (F).

**Prerequisite(s):** SPAN 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

**SPAN 302 Advan Conversation Comp II  3 Credit Hours**
Continuation of SPAN 301 with emphasis on the command of conversational and writing skills. (W).

**Prerequisite(s):** SPAN 301 or Spanish Language Placement with a score of 302

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**Spanish Language Placement Exam**
A brief language placement exam is available for students who feel confident of their language skills. This exam consists of multiple-choice, listening, and writing exercises. It is designed to place students appropriately into the beginning, intermediate, or advanced level of the Spanish sequence. Upon passing the placement exam, students can be placed into the course that best matches their language skills. The exam is open to all students, regardless of their prior language experience. Candidates should bring a pen for the writing portion of the exam. The exam is administered in the appropriate departmental office. Students who are confident of their language skills and who feel they have already mastered the content of the lower-level courses are encouraged to take the exam.
SPAN 305  Language of Business  3 Credit Hours
An introduction to the language and practices of the Hispanic world of business. Particular emphasis will be placed on learning the terminology used in typical business correspondence and documents. A variety of businesses will be examined and practice in reading and composing business letters will be provided. (AY).
Prerequisite(s): SPAN 301

SPAN 310  Intro to Hispanic Linguistics  3 Credit Hours
This class provides students with a systematic overview of key areas of Spanish linguistics, including the sound system, forms of words, syntactic patterns, the development of the language, and regional, social and contextual variation.
Prerequisite(s): SPAN 301
Restriction(s): Can enroll if Level is Undergraduate

SPAN 321  Spanish Food and Cuisine  3 Credit Hours
Spanish 321 is a course intended to provide students with an overview of Spanish Peninsular culture, civilization and history through the analysis and exposure to its foods, products, dishes and social events around its eating habits. (OC)
Prerequisite(s): SPAN 301

SPAN 350  Masterpiece of Latin Amer Lit  3 Credit Hours
A survey of Latin American literature from the colonial period to the present. Emphasis will be placed on such influential and outstanding contemporary authors as Borges, Garcia Marquez, Paz, Poniatowska, Rosario, Ferre, and Rulfo. (AY).
Prerequisite(s): SPAN 301

SPAN 351  Masterpieces of Spanish Lit  3 Credit Hours
An overview of Spanish Peninsular literature beginning with the Medieval period. Students read and discuss outstanding works from a variety of literary periods and genres. Works by authors such as Cervantes, Lope de Vega, Calderon, Galdos, Unamuno, Lorca, and Goytisolo are included. (AY).
Prerequisite(s): SPAN 301

SPAN 353  Latino Literature  3 Credit Hours
The course offers a selection of literary representations from a range of Latino groups with an emphasis on Cubans, Dominicans, Mexicans, and Puerto Ricans in the United States. Students examine these minority groups and the realities of their migrations through a variety of literary periods and genres.
Prerequisite(s): SPAN 301

SPAN 356  Spanish Civilization and Cult  3 Credit Hours
A survey of Spanish civilization from its origins to the present. The course explores the achievements of the Spanish people in art, architecture, music, literature, and the sciences and examines aspects of contemporary Spanish institutions and society.
Prerequisite(s): SPAN 301

SPAN 357  Latin American Civiliztn Cult  3 Credit Hours
A survey of Hispanic culture in the Americas from its inception to the present. The course examines the contributions of the Latin American ethnic groups and explores the relationship between Latin America’s past and contemporary achievements and problems.
Prerequisite(s): SPAN 301

SPAN 358  Spain in the Twentieth Century  3 Credit Hours
A cultural study of the institutions, issues, and values of Spanish society in the twentieth century as seen in art, architecture, music, literature, film, and the media. Special emphasis is placed on contemporary Spain from the end of the Franco era through the development of a democracy. (OC).
Prerequisite(s): SPAN 301

SPAN 359  Three Cultures of Spain  1 Credit Hour
Spanish 359 complements Spanish 356, Civilization and Culture of Spain. In Spanish 356, students learn the culture and civilization of Spain from 711 to 1492 when Christians, Muslims and Jews were sharing territory and culture was flourishing due to the hybridity connections during these centuries. In this course, the legacy of these cultures/philosophies in Spain are studied in order to show students the importance of architecture, scientific advances (monuments, towns, castles, mosques, synagogues, old towns, ruins, and palaces) in Spain’s three cultures era. (OC)

SPAN 385  Spanish Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in Spanish are related to the subject matter of the second course and are discussed with a Spanish-area faculty member. Materials are also integrated into the assignments of the second course. (OC).
Prerequisite(s): SPAN 202

SPAN 390  Topics in Spanish  3 Credit Hours
Examination of problems and issues in selected areas of Spanish. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): SPAN 301

SPAN 398  Independent Studies in Spanish  1 to 6 Credit Hours
Readings or analytical assignments in Spanish in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. Students may receive a maximum of six credit hours for a combination of SPAN 398 and SPAN 399. (F,W).

SPAN 399  Independent Studies in Spanish  1 to 6 Credit Hours
Readings or analytical assignments in Spanish in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. May be repeated for a maximum of 6 credit hours. (F,W).

SPAN 406  Advanced Written Expression  3 Credit Hours
Through the reading and analysis of authentic materials students will develop and improve their writing skill in various narrative styles such as dialogue, description, essay or research paper. Writing as a process involving editing and revision will be emphasized. (AY).
Prerequisite(s): SPAN 302

SPAN 409  Oral Expression  3 Credit Hours
A course designed to increase the conversational skills of advanced-level students. A variety of activities and assignments will help students refine their oral accuracy and expand upon the number of social situations in which they can function. (AY).
Prerequisite(s): SPAN 302

SPAN 420  Introduction to Translation  3 Credit Hours
An introduction to the history, theory and practice of English-to-Spanish and Spanish-to-English translation. Emphasis will be placed on material selected from the fields of business and commerce, the legal system, and brief passages of literature. Class projects will include translations of advertisements, brochures, and documents provided by area businesses. (AY).
Prerequisite(s): SPAN 302
SPAN 421  Advanced Translation  3 Credit Hours
The course will continue to apply the translation theory and techniques introduced in SPAN 420, and it will continue to focus on English-to-Spanish and Spanish-to-English non-literary translation. Emphasis will be placed on materials selected from the fields of business, advertising, and legal discourse. Class projects will include translation of advertisements, legal documents, and business brochures. (AY,W).
Prerequisite(s): SPAN 305 and SPAN 420

SPAN 450  Hispanic Cinema  3 Credit Hours
An introduction to the history and critical analysis of representative Hispanic films of major directors from Spain and Latin America. Emphasis will be placed on the historical, political, and cultural content of these films as they reflect the problems, customs, and contradictions of Hispanic culture. (AY).
Prerequisite(s): SPAN 301

SPAN 451  Spanish Film  3 Credit Hours
An introduction to the history and critical analysis of representative Spanish films of major directors from Spain. Emphasis will be placed on the historical, political, social and cultural content of these films as they reflect the problems, customs, and contradictions of Spanish culture.
Prerequisite(s): SPAN 301

SPAN 465  Contemporary Spanish Lit  3 Credit Hours
Spanish 465 provides students with an overview of Contemporary Spanish Peninsular literature and culture through the analysis of narrative texts. Selected readings provide the basis for stylistic and textual analysis. Fostering critical thinking through an analysis of texts is the primary focus of the class. The course specifically examines narrative works that belong to the Spanish literary canon produced after the end of an almost forty year dictatorial regime in 1975. The literary works are deeply rooted in Spain’s social and cultural history. Consequently, they describe the contemporary socio-political scene in which they were produced and look at the uncertain future of this reborn nation.
Prerequisite(s): SPAN 301

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

SPAN 490  Topics in Spanish  3 Credit Hours
Examination of problems and issues in selected areas of Spanish language, literature, culture and/or civilization. Title as listed in the Schedule of Classes changes according to content. Course may be repeated for credit when specific topic differs. (OC).

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Speech (SPEE)

SPEE 101  Principles of Speech Comm  3 Credit Hours
Course is designed to help students become better producers and consumers of oral communication in a diverse democratic society. Students will gain experience and confidence in fundamentals of effective speech writing, presentation, and criticism. Emphasis is placed on researching and selecting credible sources, integrating supporting material, rhetorical invention, audience analysis, speech organization, topic development, delivery skills, visual aids, and effective language.

SPEE 301  Interpersonal Communication  3 Credit Hours
Course adopts a discussion and activities-centered approach to understanding and applying principles and methods associated with successful interpersonal communication. Students will study and refine the communication of relationship in dyadic settings as it is influenced by cultural and gender differences. Non-verbal variables, listening, and assertive communication are just a few of the areas of discourse that will be studied in relationship to expanding cultural and gender awareness.
Prerequisite(s): SPEE 101

SPEE 320  Public Argument and Advocacy  3 Credit Hours
Students gain perspectives and experience as both critical consumers and informed producers of public discourse. Students will become familiar with basic theories of rhetorical action, engage in critical analysis of varied public arguments and rhetorical events, and prepare speeches of advocacy intended for both real and imagined audiences. (YR).
Prerequisite(s): SPEE 101

SPEE 330  Argumentation and Debate  3 Credit Hours
This course covers the logical and legal foundations of the argumentation process. Offers practical and theoretical experience in analysis, reasoning, case-building, evaluation of evidence, refutation, and cross-examination. (AY).
Prerequisite(s): SPEE 101

SPEE 340  Persuasion & Social Movements  3 Credit Hours
Course examines theories of persuasion by considering the interrelationship among social movements, the public sphere, and persuasive practices. Through lectures, discussions, and analysis of speeches and other persuasive artifacts, the course focuses on how citizens employ persuasive strategies and tactics to effect change in their community and society at large. Emphasis will be placed on case studies (both social movements and other persuasive enterprises) that illustrate the theory and practice of persuasion.
Prerequisite(s): SPEE 101

SPEE 399  Independent Studies in Speech  1 to 3 Credit Hours
Readings or analytical assignments in speech in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. (F,W).

SPEE 430  Small Group Communication  3 Credit Hours
A survey of small group behavior from the perspectives of theory, research, and practice. Activities and discussion will emphasize skills in leadership, problem solving, policy making, and the development of consensus. Students cannot receive credit for both SPEE 430 and SPEE 530. (AY).
Prerequisite(s): SPEE 101

Restriction(s):
Cannot enroll if Class is Graduate

SPEE 442  20th Century Public Argument  3 Credit Hours
This class is a survey of American public address in the 20th century. Students will examine and critically analyze several of the most significant speeches and rhetorical movements of the last one hundred years. Through lectures, discussions, and analysis of speeches and other artifacts, we will focus on the relationship between rhetoric and history, and how theories of rhetorical action help us appreciate the role of discourse in the effective functioning of a democratic system. Students will learn to utilize several critical perspectives as a means of understanding both historical and contemporary political discourse. (W).
Prerequisite(s): SPEE 101

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Statistics (STAT)

STAT 263  Introduction to Statistics  3 Credit Hours
Frequency distributions and descriptive measures. Populations, sampling, and statistical inference. Elementary probability and linear regression, use of statistical computer packages to analyze data. Students intending to elect this course should have taken at least one year of high school algebra. (F,W,S).

STAT 301  Biostatistics I  3 Credit Hours
Samples and populations, quantitative vs. categorical data; clinical vs. epidemiological studies; comparative displays and analysis; linear regression. Estimation of effect size is emphasized along with the P-value for a statistical test: difference of means in simple comparative data together with a confidence interval and t-test; relative risk for appropriate categorical data; slope of a regression line together with a confidence interval and t-test. Study design is emphasized: clinical trials in experimental settings; case-control and cohort studies in epidemiological settings. Students are expected to make presentations interpreting and reporting the results of research from the literature. Students can receive credit for only one of MATH 301, MATH 363, STAT 301, CRJ 383, SOC 383, STAT 325.
Prerequisite(s): MATH 113 or MATH 115

STAT 305  Intro. to Data Science  3 Credit Hours
With increasing availability of data, companies, governments, and nonprofits alike are striving to convert this data into knowledge and insight. This course will provide students with the basic skill set needed to handle such data. The course will focus on three broad areas: inferential thinking, computational thinking, and real-word applications. We will discuss data collection, data cleaning and exploratory analysis of data so that students can connect the data to the underlying phenomena and be able to think critically about the conclusions that are drawn from the data analysis. The students will also learn how to write short programs to be able to automate the data analysis process developing an applied understanding of different analytics methods, including linear regression, logistic regression, clustering, data visualization, etc. Most of the material will be taught using real world data. (YR)

STAT 325  Applied Statistics I  4 Credit Hours
This course studies the principles and applications of statistics. Topics include descriptive statistics, random variables, probability distributions, sampling distributions, the central limit theorem, confidence intervals, hypothesis testing for mean and variance and the use of normal, chi-square, F and t distributions in statistical problems. Other topics are selected from regression and correlation, the design of experiments and analysis of variance. Students can receive credit for only one of CRJ 383, MATH 301, 363, STAT 301, 363, SOC 363 and STAT 325. (F,W)
Prerequisite(s): MATH 113 or MATH 115 or Mathematics Placement with a score of 116

STAT 327  Statistical Computing  3 Credit Hours
This course focuses on computational techniques that are crucial for statistics applications. Using the statistical packages R and SAS, the course teaches students about importing and storing data, manipulating and visualizing data, debugging and re-sampling, as well as simulation methods including bootstrap and Monte Carlo methods. (YR)
Prerequisite(s): STAT 325

STAT 330  Intro to Survey Sampling  3 Credit Hours
An introduction to survey sampling techniques assuming only a limited knowledge of higher-level mathematics. Topics include: simple and stratified random sampling, estimation, systematic sampling, simple and two stage cluster sampling, population size estimation.

STAT 390  Topics in Applied Statistics  3 Credit Hours
A course designed to offer selected topics in applied statistics. The specific topic or topics will be announced together with the prerequisites when offered. Course may be repeated for credit when specific topics differ. (OC)
Restriction(s):
Can enroll if Level is Undergraduate

STAT 430  Applied Regression Analysis  3 Credit Hours
Topics include single variable linear regression, multiple linear regression and polynomial regression. Model checking techniques based on analysis of residuals will be emphasized. Remedies to model inadequacies such as transformations will be covered. Basic time series analysis and forecasting using moving averages and autoregressive models with prediction errors will be covered. Statistical packages will be used. Students cannot receive credit for both STAT 430 and STAT 530.
Prerequisite(s): STAT 425 or STAT 325 or IMSE 317

STAT 440  Design and Analysis of Experiment  3 Credit Hours
An introduction to the basic methods of designed experimentation. Fixed and random effects models together with the analysis of variance techniques will be developed. Specialized designs including randomized blocks, latin squares, nested, full and fractional factorial will be studied. A statistical computer package will be used. (W).
Prerequisite(s): STAT 326 or STAT 425 or STAT 325

STAT 445  Survival Analysis  3 Credit Hours
Full Course Title: Reliability and Survival Analysis This course focuses on fundamentals of statistics with emphasis on environmental problems and their relevance in everyday life. The course topics include data visualization, parametric and non-parametric statistical inferences such as multiple linear regression, analysis of bivariate measurements, contingency table, goodness of fit tests, and comparison of several groups, and ANOVA testing. (AY)
Prerequisite(s): STAT 430
Restriction(s):
Can enroll if Level is Undergraduate

STAT 450  Multivariate Stat Analysis  3 Credit Hours
An introduction to commonly encountered statistical and multivariate techniques, while assuming only a limited knowledge of higher-level mathematics. Topics include: multivariate analysis of variance, multivariate regression, principal components and factor analysis, canonical correlation, and discriminant analysis.
Prerequisite(s): STAT 430

STAT 455  Environmental Statistics  3 Credit Hours
The primary objective of the course is to introduce statistical techniques to make data driven decisions to students majoring in the environmental and biological sciences. This course aims to nurture the importance of statistical methods to enhance the understanding of issues related to environmental sciences. A one-semester course cannot be exhaustive in depth and width of literature but the aim of this course is to create interest and encourage students to delve more into the subject. (AY)
Restriction(s):
Can enroll if Level is Undergraduate
**STAT 460  Time Series Analysis  3 Credit Hours**

An-Introduction to time series, including trend effects and seasonality, while assuming only a limited knowledge of higher-level mathematics. Topics include: linear Gaussian processes, stationarity, autocovariance and autocorrelation; autoregressive (AR), moving average (MA) and mixed (ARMA) models for stationary processes; likelihood in a simple case such as AR(1); ARIMA processes, differencing, seasonal ARIMA as models for non-stationary processes; the role of sample autocorrelation, partial autocorrelation and correlograms in model choice; inference for model parameters; forecasting: dynamic linear models and the Kalman filter.

**Prerequisite(s):** STAT 430

**STAT 490  Topics in Applied Statistics  3 Credit Hours**

**STAT 490A  Topics in Applied Statistics  3 Credit Hours**

**TOPIC TITLE: Multivariate Statistical Analysis**

A coverage of commonly encountered statistical and multivariate techniques, while assuming only a limited knowledge of higher-level mathematics. Topics include: Multivariate analysis of variance, multivariate regression, principal components and factor analysis, canonical correlation, discriminant analysis, and cluster analysis.

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:

- (F) fall term;
- (W) winter term;
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**Urban and Regional Studies (URS)**

**URS 300  Urban and Regional Studies  3 Credit Hours**

In this course we will explore the field of urban and regional studies. The scope of readings is inter-disciplinary, spanning the environmental, aesthetic, social, economic, geographic, historical, political and cultural aspects of cities, suburbs and regions. The interrelationship between the spatial organization of a city, patterns of social and economic inequality, delivery of services, the relationship between culture and public space, as well as the processes of urban and regional change will all be considered. Problems such as race and class inequality will also be examined. Special attention will be given to issues of relevance in the Detroit metropolitan region (e.g. spatial, economic, cultural, political and social impacts of the loss of manufacturing jobs). Students will be introduced to methods of social scientific analysis and will begin to apply those methods to researching urban and regional community groups, enterprises and social movements.

**URS 301  SiD--Field Internship  3 Credit Hours**

Full Course Title: Semester in Detroit: Field Internship

This course serves as a field internship course for the Semester in Detroit (SiD) program. Students in this course work for 200 hours in an internship with a community-based organization in Detroit over 12 weeks (average of 16 hours per week). They also participate in an internship reflection seminar (co-requisite). Students must apply to, and be accepted by, UM-Ann Arbor’s in Detroit program to enroll in this course. (F;W;S)

**Corequisite(s):** SSCI 302

**URS 302  SiD--Intern Seminar  2 Credit Hours**

This course serves as a core course for the Semester in Detroit (SiD) program. The primary purpose of this class is to provide a supportive, yet challenging learning space for reflecting on your Detroit internship experiences this semester. There are three main sources of material for this class: you, the internship, and Detroit. While, in theory, each is distinct, in practice, all three are intertwined and interact and affect one another. Your challenge will be learning to see more clearly the interactions among these domains. Students must apply to, and be accepted by, UM-Ann Arbor’s Semester in Detroit program to enroll in this course.

**URS 360  SiD--20th Cent Detroit History  3 Credit Hours**

This course serves as the core course for the Semester in Detroit (SiD) program. It examines the transformation of Detroit from the late 19th, through the 20th and into the 21st Centuries. Our goal is to identify the main forces and patterns of change in Detroit’s past that have shaped the contemporary city you encounter today. Thus, the course is organized chronologically, but we will be exploring the city’s history alongside consideration of contemporary social issues, challenges, and debates. Course material will include a range of readings, films, and excursions. Through discussion of this material and in written assignments, the course encourages you to develop your own interpretation of the circumstances, challenges and opportunities currently facing the city. Students must apply to, and be accepted by, UM-Ann Arbor’s Semester in Detroit program to enroll in this course. (F;W;S)

**URS 390  Topics Urban&Regional Studies  1 to 3 Credit Hours**

Problems and issues in selected areas of urban and regional studies. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when specific topic differs.

**URS 450  Sr Capstone in Community Rsrch  3 Credit Hours**

The capstone course is designed to assist students in integrating the concepts, theories, and methods of inquiry or urban studies into research or in the surrounding metropolitan area. Open to students in urban and regional studies who have completed their community-based learning requirement for the concentration.

**URS 485  Urban Regional Stud Internship  3 to 6 Credit Hours**

The internship offers students the opportunity to learn and apply concepts learned in Urban and Regional Studies coursework to real world settings in municipal and regional government offices, non-profit and community organizations, or businesses dedicated to design, development, or data. The student has 8-16 hours of unpaid work per week under the guidance of a faculty advisor. Primarily for junior or senior URS students or other qualified applicants. Up to 6 credits can be used to fulfill the community-based research requirement for urban and regional studies concentrators, with the approval of the URS director.

**Prerequisite(s):** URS 300

**Restriction(s):**

Cannot enroll if Class is Freshman

**URS 499  Independent Study  3 Credit Hours**

Readings, community-based research and analytical assignments in accordance with the needs and interests of the student and approval of the instructor. Students must submit a written proposal of study for approval. In addition, students electing to take this course in partial fulfillment of their community-based research must get approval from the Director of the Urban and Regional Studies program. (F;W;S)

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**
**Women's and Gender Studies (WGST)**

**WGST 303** Intro to Women's & Gender Stud 3 Credit Hours  
This course provides an interdisciplinary overview of the key theories and topics in Women's and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women's and men's lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.  
**Restriction(s):**  
Cannot enroll if Class is Freshman

**WGST 315** Body Image and Culture 3 Credit Hours  
This course examines the biological and sociocultural construction of body image in both men and women. We explore such cultural and social practices as nudity, tattooing, piercing, scarification, dietary habits, physical activity and sports performance and their associated myths and realities. We explore how the human body is a terrain of contested meaning within society. The course provides an examination of the causes and consequences of women's poor body image, contemporary and historically. Course materials include case studies from North America, Europe, Africa, Asia and the Pacific.  
**Prerequisite(s):** ANTH 101 or WST 275 or WGST 275 or WGST 303 or PSYC 275 or ANTH 275 or HUM 275 or PSYC 303 or ANTH 303 or SOC 303 or HUM 303 or SOC 275

**WGST 325** Gender, Science & Engineering 3 Credit Hours  
Explores some of the history of women in science and engineering, the current status of women in science and engineering, and feminist theory in research. Topics include cultural influences on women in science and engineering, careers and life balance, and a feminist approach to scientific and engineering teaching and research.  
**Prerequisite(s):** NSCI 101 or NSCI 120 or NSCI 121

**WGST 326** Poverty and Discrimination 3 Credit Hours  
An analysis of the economic aspects of poverty and discrimination. Emphasis on the theoretical economic causes of poverty and the economic bases for discriminatory behavior, the impact of poverty and discrimination on individuals and society and the effect of reform policies on the two problems.  
**Prerequisite(s):** ECON 201 and ECON 202

**WGST 335** Women in Medieval Art 3 Credit Hours  
Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women's roles in the creation and patronage of art and literature, economic and family issues, and women's participation in new and innovative forms of religious piety.  
**Prerequisite(s):** ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106 or WGST 275 or WGST 303 or HUM 275 or HUM 303 or ANTH 275 or ANTH 303 or PSYC 275 or PSYC 303 or SOC 275 or SOC 303 or WST 275

**WGST 336** Perspectives in Women's Health 3 Credit Hours  
Topic: Perspectives in Women's Health. This course examines women's health issues across the human lifespan, using feminist and sociocultural perspectives. Topics to be explored include the social construction of women's sexuality, reproductive options, health care alternatives and risk for physical and mental illness. Attention to the historical, economic, and cultural factors that influence the physical and psychological well-being of women is an underlying theme. (F,W,Y)  
**Restriction(s):**  
Cannot enroll if Class is Freshman

**WGST 337** Women Musicians/West Mus Hist 3 Credit Hours  
Through a historical survey of female musicians from the Middle Ages to the present day, this course takes a critical look at theories of creativity and professionalism as they relate to female musical production. The course deals with women in European "art music" traditions and also in jazz and poplar music. Social and cultural norms dictating appropriate female involvement with music are examined. The historical approach will serve to reveal ways in which terms such as professionalism and virtuosity have continually shifted and changed in reference to female musical performance. The course challenges students to re-think many of the commonly accepted gender-based descriptions of particular genres and elements of music through listening and musical analysis.  
**Prerequisite(s):** MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or WGST 275 or PSYC 275 or HUM 275 or SOC 275 or ANTH 275 or WGST 303 or ANTH 303 or SOC 303 or PSYC 303 or HUM 303 or WST 275  
**Restriction(s):**  
Cannot enroll if Class is Freshman

**WGST 338** Women&Islam Mid East to 1900 3 Credit Hours  
This course covers the historical development of Islam's normative stance towards women and gender roles in the Middle East from the rise of Islam to the earliest stirrings of feminist activism.  
**WGST 3385** Sex, War, and Violence 3 Credit Hours  
This course centers the often overlooked role of gender and sexuality in the 20th century European mobilizations of state violence such as the Holocaust, Armenian Genocide, and conflicts in the former Yugoslavia. It emphasizes the clashes that occurred between gains in gender and sexual rights during the century and projects of state violence that were frequently aimed at dismantling these gains. Attention is paid to the intersection of race, class, religion and gender in the (re)construction of new gender and sexual hierarchies in conflict and post-conflict contexts in the region.  
**WGST 362** Women, Politics, and the Law 3 Credit Hours  
An examination of the political behavior of women in American politics. Included is an analysis of the legal and legislative demands of American women.  
**Restriction(s):**  
Can enroll if Level is Undergraduate  
Can enroll if College is Arts, Sciences, and Letters

**WGST 3651** Women/Leadership/Social Change 3 Credit Hours  
The purpose of this seminar is to examine women's leadership in movements for social change. We will approach this topic through the study of historical examples, drawn primarily from the twentieth-century United States, and including movements for economic justice, race relations, sexual identity, peace, gender equality, public health and social welfare. HIST 112 and WGST/ANTH/HUM/SOC/PSYC 303 recommended as prerequisites. (W)  
**Restriction(s):**  
Cannot enroll if Class is Freshman  
Can enroll if Level is Undergraduate
WGST 366 Sexualities, Genders, & Bodies 3 Credit Hours
This course introduces key questions and debates in lesbian, gay, bisexual, transgender, and queer studies. Through engagement with multidisciplinary sources, students explore how sexualities, genders, and bodies are constructed and contested, how these constructions vary in diverse contexts and historical moments, and what gaps remain in our knowledge of LGBTQ lives. (YR)

WGST 370 Women in America-Hist Perspect 3 Credit Hours
A survey of American women's history from the colonial period to the present. Among the topics included are family roles, women's economic status, women's education and women in American political life.

WGST 384 Feminist Philosophy 3 Credit Hours
Feminists working in philosophy, most notably in the 19th and 20th centuries, have altered the traditional philosophical canon by first, recovering women philosophers who were essentially erased from the history and secondly, by extending and contributing to the standard questions of philosophy. For example, one central question of philosophy; "What can we know with certainty?" has been transformed through a feminist lens and reinterpreted as "What does one's gender, social location and cultural framework contribute to what one knows?" In this course we will look at the variety of feminist philosophical theories with a focus on epistemology, metaphysics and ethics.
Prerequisite(s): PHIL 100 or WGST 275 or WGST 303 or HUM 275 or ANTH 275 or PSYC 275 or SOC 275 or WST 275 or HUM 303 or ANTH 303 or PSYC 303 or SOC 303

WGST 385 Language and Gender 3 Credit Hours
Examines theories of differences between male and female speakers of English, focusing on phonological, syntactic, semantic, stylistic and conversational features, with analyses of differences in speaking strategies and agendas of male and female speakers, as well as split-language situations in the workplace, home and social settings.
Prerequisite(s): LING 280 or LING 281

WGST 386 Gender Issues in Literature 3 Credit Hours
A study of gender issues in English and American Literature. The exact topic will vary from semester to semester, but the course may feature such topics as gay and lesbian literature, feminist criticism, images of masculinity, the representation of sexual ideologies, etc. Course may be repeated for credit when specific topics differs.
Prerequisite(s): ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200

WGST 387 Gender,Sex,Powr Screen Studies 3 Credit Hours
This course examines representations of gender and sexuality across multiple screens, with a particular emphasis on Hollywood, independent, and non-Western cinema. In addition, the course explores intersections of gender with race, class, and ability to further investigate power structures in contemporary screen studies. The course will engage with a range of debates in film theory and women's and gender studies, and enable students to apply concepts and theories to specific media texts.
Prerequisite(s): JASS 248 or WGST 275 or ANTH 275 or PSYC 275 or SOC 275 or WGST 303 or ANTH 303 or PSYC 303 or SOC 303 or WST 275 or HUM 240 or ENGL 240 or FILM 240 or ENGL 248 or HUM 248 or FILM 248 or JASS 240 or HUM 275 or HUM 303

WGST 388 LGBTQ Religious Experience 3 Credit Hours
This course explores intersections of religion, spirituality, and faith with sexuality and gender. Christianity and Islam receive particular attention. We also examine LGBTQ journeys within Buddhism, Hinduism, Judaism, new spiritual movements, and interfaith work. Assignments create room for students to engage faith traditions that are not covered in the course readings. The course highlights intersections at three levels of analysis: the individual or personal level (how do LGBTQ identities intersect and interact with religious freedom and practice?), the interactional or community level (how do LGBTQ people experience belonging and rejection in diverse faith communities?), and the institutional level (how do the structures of these belief systems shape the life chances of LGBTQ people in society?). (F,S,AY)

WGST 390 Topics in Women's Studies 3 Credit Hours
Examination of problems and issues in selected areas in Women's and Gender Studies. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs. (YR)
Prerequisite(s): WST 275 or WGST 275 or WGST 303

WGST 393 Black Women, Rel & Spiritually 3 Credit Hours
This lecture course surveys descriptive and critical literature relevant to the religious and spiritual experience and thought of African diasporic women. Studying religiosity and spirituality among this population helps students understand this influential, culturally-constructed world view of Black women as they engage in a variety of institutions including healthcare, economic activity, the criminal justice system, politics, and social relationships. The course gives particular attention to Black feminist and Womanist literature on these topics. (AY)
Restriction(s):
Cannot enroll if Class is Freshman

WGST 3955 Diversity and the Workplace 3 Credit Hours
This course will: 1) discuss gender, race, ethnicity, disability, age, sexual orientation, and appearance as aspects of diversity; 2) examine social values and practices, and organizational policies and procedures that affect or have affected the employment opportunities of underrepresented groups; 3) examine individual (e.g., prejudice, stereotypes), group (e.g., in-groups and out-groups), and organizational (e.g., climate and culture) processes that affect work place diversity; and 4) discuss "best practices" for promoting an organizational culture that values diversity, along with a diverse work force.
Prerequisite(s): PSYC 4305 or PSYC 431 or WST 275 or WGST 275 or OB 354 or HRM 405 or WGST 303 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303 or PSYC 101

WGST 401 Images of Women in Germany 3 Credit Hours
This course will focus on the position of women in Germany after WWII and up to and after the unification of East and West Germany. Particular attention will be given to the gendered history of working through the National Socialist past, the division and reconstruction of the two nation-states, and the terrorism in West Germany in the 1970's. Students will examine images of women in films and tie them to the ideologies of gender and status of women in these larger issues of German history. Course readings will be in English. Students wishing to receive German credit for the course must enroll concurrently in GER 380: Praktikum. Students cannot receive credit for both WGST 401 and WGST 501.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
WGST 404  Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic and political in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a "natural order," obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both WGST 404 and WGST 504.
Restriction(s):
Can enroll if Level is Undergraduate

WGST 405  Gender Roles  3 Credit Hours
This course will investigate the development of sex roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of sex roles upon male-female relationships within our society and the possibility of transcending sociological sex roles in alternate modes of living. Students cannot receive credit for both WGST 405 and WGST 505.
Prerequisite(s): PSYC 171 or SOC 200 or SOC 201 or PSYC 170 or ARTH 101

WGST 406  Culture and Sexuality  3 Credit Hours
The study of women, men, children, socialization practices and the genesis of sex roles cross-culturally. Students cannot receive credit for both WGST 406 and WGST 406.
Prerequisite(s): ANTH 101 or WGST 275 or WST 275 or WGST 303 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303

WGST 408  Sex, Gender and the Body  3 Credit Hours
This course provides an overview of gender issues in development in the global South, including the differential effects of development policies on women and men, and the role of social movements in transforming development policy frameworks. Students may not receive credit for both WGST 408 and 508. For graduate credit, students should elect WGST 508.
Prerequisite(s): WGST 303 or ANTH 303 or HUM 303 or PSYC 303 or SOC 303
Restriction(s):
Can enroll if Class is Junior or Senior

WGST 409  Feminist Theories  3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women's and men's lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Students will not receive credit for both WGST 409 and WGST 509. (AY)
Prerequisite(s): WGST 275 or WST 275 or SOC 200 or SOC 201 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

WGST 412  Men and Masculinity  3 Credit Hours
This course addresses the question, "What is a man?" in various historical, cross-cultural and contemporary contexts. A major focus is on the social and cultural factors that underlie and shape conceptions of manhood and masculinity in America as well as in a variety of societies around the globe.
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

WGST 416  Earl Mod Jpn Paint&Wood Prnts  3 Credit Hours
Painting and woodblock prints of the Edo/Tokugawa (1600-1868) and Meiji (1868-1912) periods are considered in light of competing developments that on the one hand looked to Japan's classical tradition and on the other to the influence of art and artists from China and from the West. Special attention is given to female artists and images of women. Students cannot receive credit for both WGST 416 and WGST 516.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103
Restriction(s):
Can enroll if Level is Undergraduate

WGST 420  Kinship and Marriage  3 Credit Hours
A study of the diversity of kinship and marriage systems, and of the history of kinship theory which has played a seminal role in the development of general anthropological history. Students cannot receive credit for both WGST 420 and WGST 520.
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Level is Undergraduate

WGST 425  Women in Classical Antiquity  3 Credit Hours
This course examines the evidence for the lives of women in Greek, Etruscan and Roman Antiquity, from the Bronze Age through the Imperial Period. Special emphasis will be placed on the archaeological evidence, especially works of art which illustrate women's lives and their relationships with men. Documents such as dedicatory and funerary inscriptions, the poetry of Sappho and Sulpicia, and selections from the writings of Homer, Hesiod, Aristotle, Pliny, Juvenal, and other ancient authors, will also be examined critically, particularly in relationship to the works of art.
Prerequisite(s): ARTH 101
Restriction(s):
Can enroll if Level is Undergraduate

WGST 433  Writing Women In Renaissance  3 Credit Hours
This course will be taught in English, and will focus on the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Asio. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe and Marguerite de Navarre. At issue will be women's roles and women's images in city and court culture during the early modern period and the interaction of their writings with the literary canons of Italy and France.
Restriction(s):
Cannot enroll if Class is Graduate
WGST 436  Reproductive Health Policy  3 Credit Hours
This course provides a comprehensive introduction to the field of reproductive health in the US. Understanding women's reproductive health requires consideration of the intersections of gender, race, class, culture, geography, economic status, and nation within a sociopolitical context. The course introduces students to the historical trends in the regulation of women's fertility and reproductive health. Readings draw from a number of different disciplines, including: law, medical studies, history, social sciences, and personal narratives to critically examine the intent and impact of current standards for reproductive health policy and practice. Topics include: reproductive justice, contraception, pregnancy, reproductive control, and family leave. Course discussions include a focus on health policy and activism to affect change related to women's reproductive health, all within a framework of reproductive justice. A major emphasis is on developing critical thinking skills that can be applied to issues of women's reproductive health in order to educate and empower students to become proactive healthcare consumers.
Prerequisite(s): SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303

WGST 445  20C/21C Women Authors  3 Credit Hours
An analysis of images and problems of women as defined by significant British and American women writers of the 20th and 21st centuries. Style and narrative technique will also be closely examined. Students cannot receive credit for both WGST 445 and WGST 545.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Level is Undergraduate

WGST 446  Marriage and Family Problems  3 Credit Hours
Sociological analysis of problems encountered within the institution of marriage with particular reference to such issues as choosing a marriage partner, sexual adjustment, occupational involvement, conflict resolution, child rearing, divorce and readjustment. Students cannot receive credit for both WGST 446 and WGST 546.
Prerequisite(s): SOC 200 or SOC 201 or WGST 275 or WST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

WGST 447  Family Violence  3 Credit Hours
Sociological analyses of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Students cannot receive credit for both WGST 447 and WGST 547.
Prerequisite(s): SOC 200 or SOC 201 or SOC 301 or SOC 443 or PSYC 405 or WST 405
Restriction(s):
Can enroll if Level is Undergraduate

WGST 450  Family, Sexuality, Rights  3 Credit Hours
Full Course Title: Family, Sexuality, and Human Rights in a Changing World. This course investigates the changing possibilities for forming families and expressing sexuality, with a focus on how nation states and legal and cultural systems construct and respond to these changes. Selected topics include the meanings of sex, love, marriage, and relatedness in different historical moments; struggles for recognition of varied kinship and family arrangements, such as interracial, interfaith, same-sex, polygamous and multi-partner relationships; and new technologies and their implications for family life. (YR)
Prerequisite(s): (WGST 303 or SOC 303 or ANTH 303 or HUM 303) or (SOC 200 or SOC 201) or (ANTH 101 or ANTH 202)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

WGST 451  Gender and Media Studies  3 Credit Hours
The course will focus on several feminist approaches used in understanding the media and attempting to create social change through the media. The role of media in the definition and reproduction of gender-based hierarchies and in the renegotiation of gender boundaries will both be explored. To this end, both mainstream and women's media will be examined. The course will take a multicultural and international perspective, incorporating concerns of class, race, ethnicity and nation as these intersect with the study of gender and media. Mainstream and alternative media will be analyzed through readings, films, case studies, in-class collaborative exercises and longer-term projects. News, entertainment and advertising genres will be examined in a variety of media, such as the printed press, television, video, film and the Internet.
Prerequisite(s): WGST 303 or HUM 303 or ANTH 303 or PSYC 303 or SOC 303 or WGST 275 or HUM 275 or ANTH 275 or PSYC 275 or SOC 275 or WST 275
Restriction(s):
Can enroll if Level is Undergraduate

WGST 455  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including: (1) formation and perseverance of immigrant communities and interethnic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles. Prerequisite and junior or senior standing. Students may not receive credit for both WGST 4555 and WGST 5555. For graduate credit take WGST 5555.
Prerequisite(s): ANTH 101 or WGST 275 or WST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

WGST 456  Cops & Cons: Women in Prison  3 Credit Hours
Course uses contemporary theories of gendered organizations to frame analyses of prison policies and practices in employment and incarceration as they reflect and reproduce gender inequalities. Analyses will be framed within a restorative justice model, that is, a critique of the current criminal justice system of retributive justice and a paradigm of what a alternative system could be.
Prerequisite(s): PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303 or SOC 200 or SOC 201 or CRJ 240 or CRJ 300
Restriction(s):
Can enroll if Class is Junior or Senior
WGST 4650  Sem in US Women's History  3 Credit Hours
Seminar on the historiography and key primary sources related to U.S. Women's History. The course covers examples of classic texts in the field as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the field, its guiding concepts, foundational texts, newest trajectories, and impact on the field of history as a whole. The graduate version of this course includes weightier readings and assignments.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

WGST 466  Arguing Feminism: Rhetoric  3 Credit Hours
An introduction to the work of major twentieth century feminists working in rhetoric and related fields. Students examine recurring themes of language, meaning, ethics and ideology, and practice writing strategies which address rhetorical and ethical concerns central to feminist/academic writing.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

WGST 470  Black Women / Lit, Film, Music  3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender and class have shaped the creative work of Black women. Students will be required to read, analyze and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash and singer Billie Holiday.
Prerequisite(s): FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 237 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Program is AB-Women's and Gender Studies

WGST 471  LGBTQ Literature  3 Credit Hours
This course surveys primarily contemporary literature by writers who identify as gay, lesbian, bi-sexual, transgender, or queer. By studying the self-representation and culturally unique perspective of this emerging community of writers, students in this course understand the emergence of LGBTQ literary traditions and understand the cultural diversity within these traditions. Students learn to identify the aesthetic qualities (such as camp, performativity, coded subtexts, homoeroticism, and the relationship between creativity and sexuality), and historical, political, and social concerns that characterize LGBTQ literary and cultural production. Topics covered include the struggle for civil rights before and after Stonewall, coming out narratives, the negotiation of homophobic cultures, post-colonial writers, and memoirs of the LGBTQ experience, as well as the historical emergence of sexual categories and the literary critique of heteronormativity. This course counts toward the English discipline diversity requirement. Students cannot receive credit for WGST 471 and WGST/ENGL 571.
Prerequisite(s): ENGL 200 or ENGL 230 or ENGL 231 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 and (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40)

WGST 473  Arab American Women Writers  3 Credit Hours
This course examines the literary and cultural contributions of Arab and Arab American women novelists, poets, filmmakers and artists to the development and consolidation of cultures of understanding and coexistence; explores the relations between, among others, citizenship and belonging, race and national security, gender and geographical mobility, and ethnic minorities and mainstream consciousness; stresses how literary and artistic productions of Arab and Arab American women writers and artists fosters alternative visions of socio-cultural coexistence, dialogue, and hospitality by means of technical and stylistic experimental and renovation.
Restriction(s):
Cannot enroll if Class is Freshman

WGST 475  Soc Construct Mental Illness  3 Credit Hours
Diversity Issues in Mental Health explores varied cultural descriptions and models of mental illness. By focusing on the ways that culture shapes how people experience, and respond to, mental illness this class explores cultural representations of mental illness, ranging from discrete illness resulting from a chemical imbalance to a profound threat to order. We seek to understand the cultural, personal, and political underpinnings of mental illness and medical practices in societies throughout the world. The course utilizes an interdisciplinary perspective, drawing from multiple sources of information regarding mental health issues, including feminism, psychiatry, history, sociology, and literature. Issues raised throughout the course include the ways gender, race, culture, religion, and stigma influence the diagnosis of mental illness, patterns of help-seeking behavior, formation of comprehensive mental health policy, and treatment options.
Prerequisite(s): SOC 200 or SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303

WGST 476  Inside Out Prison Exchange  4 Credit Hours
This community-based course, taught in a local correctional facility, brings university students and incarcerated students together to study as peers. Together students explore issues of crime and justice, drawing on one another to create a deeper understanding of how these issues affect our lives as individuals and as a society. The course creates a dynamic partnership between UMD and a correctional facility to allow students to question approaches to issues of crime and justice in order to build a safer and more just society for all. The course encourages outside (UMD) students to contextualize and to think deeply about what they have learned about crime and criminals and to help them pursue the work of creating a restorative criminal justice system; it challenges inside students to place their life experiences into larger social contexts and to rekindle their intellectual self-confidence and interest in further education.
Restriction(s):
Can enroll if Class is Junior or Senior

WGST 477  Women and Gend Studies Intern  3 Credit Hours
Provides field experience in social welfare or criminal justice agencies e.g., for children/adolescents in residential programs, in abuse remediation, in probation, for chemical dependencies, in victim advocacy, for the elderly, in prisons, for special needs populations, in services, in medical/public health, in police services, and for families and communities. Supervision by approved field instructors. An internship of 80 hours is required for three (3) credits. Instructor and student will work together to determine appropriate intern placement. Approval of instructor and the Women's Studies Director in required.
Prerequisite(s): ANTH 275 or SOC 275 or WST 275 or PSYC 275 or HUM 275 or WGST 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
WGST 481 Gender and Globalization 3 Credit Hours
Mass media, politics and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create.
Prerequisite(s): HUM 303 or PSYC 303 or SOC 303 or WGST 303
Restriction(s):
Can enroll if Level is Undergraduate

WGST 484 Violence Against Women 3 Credit Hours
Course examines local and global social violence against women outside family and other intimate relationships. Students consider violations against women's human rights through the life cycle, which are often sanctioned under the guise of cultural practices and misinterpretations of religious tenets. Topics include sex-selective abortion and female infanticide (the "missing millions"); female genital mutilation and cosmetic surgeries; prostitution and pornography; trafficking in women; sexual harassment; and women's experiences of war as soldiers, non-combatants and refugees. Topics are "paired," that is, students compare understandings of Western and non-Western social practices related to gender. Students examine both institutionalized sexism and racism, as part of political, economic, and social systems, and sexism and racism as realities affecting individual women's lives.
Prerequisite(s): SOC 200 or SOC 201 or WGST 303 or HUM 303 or PSYC 303 or ANTH 303 or SOC 303 or WGST 275 or HUM 275 or PSYC 275 or SOC 275 or ANTH 275 or WST 275
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

WGST 486 Queer Theory & Literature 3 Credit Hours
This course reads theories of sexuality to analyze how writers since 1600 have imagined printed text to reflect and shape desire, particularly same-sex desire. The course questions how same-sex desire appears in literature written before the theorization of "the Homosexual" in the late nineteenth century as well as how writers imagine sexuality before a hetero/homosexual binary appears. Writers may include contemporary theorists (Sedgwick, Foucault, Butler) as well as novelists (Gaskell and Stoker), playwrights (Kushner and Wycherley), and poets.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

WGST 487 Monsters, Women & the Gothic 3 Credit Hours
This course questions our inheritance of the "the gothic" as a district literary style that continues to discipline readers? notions of gender and sexual identity. The course argues that by tracing the gothic's literary style that continues to discipline readers' notions of gender and sexual identity. The course argues that by tracing the gothic's literary history, we may simultaneously witness a history of gender formation. Readings may include English novelists who originated a gothic style in English (Walpole, Radcliffe, Lewis) as well as English and American poets and novelists who have debated as well as resisted the effects of the gothic on readers? (particularly women's) psychology (Christina Rossetti, Austen, King, Stoker).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

WGST 490 Topics in Women's Studies 3 Credit Hours
Examination of problems and issues related to Women's Studies. Title as listed in Schedule of Classes will change according to specific content. Course may be repeated for credit when specific topics differ.
Prerequisite(s): WST 275 or WGST 275 or LIBS 580 or WGST 303
Restriction(s):
Can enroll if Level is Undergraduate

WGST 498 Women's & Gender St Thesis 1 to 6 Credit Hours
A thesis project that is the culmination of the minor in Women's Studies. Students meet with the instructor to reflect on past studies and plan current projects, to conduct research that addresses a gender issue in the larger community, and to write a thesis under the direction of the faculty member. Research involving participant-observer in social agencies is encouraged where appropriate.
Restriction(s):
Can enroll if Level is Undergraduate

WGST 499 Independent Studies 1 to 6 Credit Hours
Provides opportunity for qualified Women's Studies students to pursue independent research under the direction of a qualified faculty member. Project must be defined in advance, in writing and must be in a subject not currently offered in the regular curriculum.
Restriction(s):
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

General Information

The University of Michigan-Dearborn is one of the three campuses of the University of Michigan operating under the policies of the Board of Regents.

The campus, located on the former estate of automotive pioneer Henry Ford, was founded in 1959 as a senior-level institution offering junior, senior and graduate-level courses and degrees. In 1971, UM-Dearborn became a comprehensive university campus offering four-year degree programs in liberal arts and sciences and graduate programs at the master's degree level.

More than 9,000 highly selective students, representing a wide range of academic interests and diverse backgrounds, are currently enrolled at the UM-Dearborn.

As part of the University of Michigan, UM-Dearborn enjoys an association with a large multi-university and the advantages of moderate size. Through expanded evening course offerings, professional development programs and cooperative education programs, UM-Dearborn continues to respond to the educational needs of commuting students from the Detroit metropolitan community.

General Education Program: The Dearborn Discovery Core

The campus-wide general education program at the University of Michigan-Dearborn, known as the Dearborn Discovery Core, is designed
to complement work in a student’s chosen area of study. These classes serve as a means of discovery for students, providing a foundation for learning, connecting to potential new areas of interest and building tools for success in whatever field a student pursues. Learning outcomes are guided by the qualities every student should develop as they move toward graduating with a University of Michigan-Dearborn degree.

The Dearborn Discovery Core requirements incorporate the Goals for the Undergraduate Experience to help ensure that students master the tools and techniques necessary to succeed in college and throughout their lives and careers. The Dearborn Discovery Core is divided into three sections: Foundational Studies, Areas of Inquiry, and Capstone Experience.

An overall Grade Point Average of 2.0 is required of students when completing the Dearborn Discovery Core.

A course can count for a maximum of three categories within the Dearborn Discovery Core.

**Foundational Studies [15 credits]**

**Written and Oral Communication [6 credits]**

Students who receive an English Placement score of COMP 106 or higher shall satisfy three credits of the Written and Oral Communication category.

1. Students are able to compose, revise, and edit their own writing for clarity and fluency of expression.
2. Students are able to demonstrate how to prepare and adapt written and oral communication to the needs of multiple audiences across professional, academic, and interpersonal contexts.
3. Students are able to demonstrate an understanding of academic integrity and use research skills including evaluating information, writing from sources, and correctly citing works.
4. Students are able to critically evaluate and use readings and ideas in composing written or oral work.

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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
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<td>COMP 106</td>
<td>Writing &amp; Rhetoric II</td>
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<td>COMP 110</td>
<td>Honors Writing &amp; Rhetoric I</td>
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<td>COMP 220</td>
<td>Honors Writing &amp; Rhetoric II</td>
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<td>COMP 270</td>
<td>Tech Writing for Engineers</td>
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<td>COMP 280</td>
<td>Business Writing &amp; Rhetoric</td>
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<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
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<tr>
<td>SPEE 101</td>
<td>Principles of Speech Comm</td>
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**Writing Intensive Course [3 upper-level credits]**

1. Students are able to demonstrate advanced competency by writing for a specific audience and integrating disciplinary ideas and concepts.
2. Students are able to effectively evaluate and use research methods, sources or technology appropriate to the field.
3. Students are able to engage in critical inquiry and thinking to synthesize or create a new rendering or perspective.
Quantitative Thinking and Problem Solving [3 credits]
1. Students are able to interpret information presented in mathematical form (e.g. with functions, equations, graphs, diagrams, tables, words, geometric figures).
2. Students are able to represent information/data in mathematical form as appropriate (e.g. with functions, equations, graphs, diagrams, tables, words, geometric figures).
3. Students are able to carry out mathematical (e.g. algebraic, geometric, logical, statistical) procedures flexibly, accurately, and efficiently to solve problems.
4. Students are able to evaluate the validity of logical or quantitative arguments.

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<td>Quantitative Research &amp; Stats</td>
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<td>DS 300</td>
<td>Quantitative Model and Anlys I</td>
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<td>DS 301</td>
<td>Intro Business Statistics</td>
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<td>HHS 410</td>
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<td>College Algebra</td>
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<td>Pre-Calculus</td>
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<td>MATH 113</td>
<td>Calc I for Biology &amp; Life Sci</td>
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<td>MATH 115</td>
<td>Calculus I</td>
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<td>MATH 131</td>
<td>Conceptual Mathematics</td>
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<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
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<td>Symbolic Logic</td>
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<td>STAT 305</td>
<td>Intro. to Data Science</td>
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Critical and Creative Thinking [3 credits]
1. Students are able to identify, summarize, and understand the problem, question, and/or issue.
2. Students are able to identify, locate, and critically or creatively evaluate evidence using appropriate sources or technology.
3. Students are able to consider and interpret alternative perspectives to support analysis.
4. Students are able to develop and communicate conclusions and implications by synthesizing technical, aesthetic, conceptual knowledge or supporting evidence.

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<td>LIBS 137</td>
<td>American Horror Stories</td>
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Areas of Inquiry [28 credits]

Natural Sciences [7 credits including one lab science course]

1. Students are able to demonstrate an understanding of the nature of the scientific method including hands-on practice.
2. Students are able to formulate and interpret testable questions that result in qualitative and quantitative data.
3. Students are able to apply unifying theories and laws to natural science disciplines and are able to explain examples.
4. Students are able to demonstrate the ability to interpret and communicate science and apply its relevance.

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<td>Inquiry:Earth/Planet Science</td>
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<td>Inquiry: Life Science</td>
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**Social and Behavioral Analysis [9 credits]**

1. Students are able to demonstrate knowledge of the fundamental concepts of a specific discipline in the behavioral or social sciences and the impact of those fundamental concepts on actions, perceptions or values.

2. Students are able to apply disciplinary knowledge in the behavioral or social sciences to contemporary or historical issues.

3. Students are able to demonstrate understanding of the methods, models or theories that produce knowledge in a specific field in the behavioral or social sciences.

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<td>CRJ 446</td>
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<tr>
<td>HIST 387</td>
<td>Aspects of the Holocaust</td>
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**Course Descriptions**

- **PHYS 151** General Physics II
- **PSYC 488** Primatology Field Course
- **CRJ 440** Abnormal Psychology
- **CRJ 443** Gender Roles
- **CRJ 446** Marriage and Family Problems
- **CRJ 453** Sociology of Law
- **CRJ 455** Immigrant Cultures and Gender
- **CRJ 473** Race, Crime and Justice
- **CRJ 489** Law, Crime, and Society
- **CRJ 494** Pol Sci Internship Seminar
- **CRJ 4130** Qualitative Research Methods
- **ECON 201** Prin: Macroeconomics
- **ECON 202** Prin: Microeconomics
- **ECON 2001** Introductory Economics
- **HIST 387** Aspects of the Holocaust
**Humanities and the Arts [6 credits]**

1. Students are able to demonstrate foundational knowledge of the subject area including the use of specialized vocabulary relevant to the area of study.

2. Students are able to demonstrate the ability for close reading of primary sources, whether works of literature, philosophical discourses, works of art, film, music, media studies, and/or digital arts.

3. Students are able to think critically and to demonstrate in writing well-reasoned or argued essays/exercises/papers.

4. Students are able to contextualize selected texts, works of art, music and/or film in relation to their production and reception (May include historical, geographical, cultural and cross-cultural context).
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Intersections [6 credits]

1. Students are able to describe how ways of knowing and creating knowledge differ across disciplines and cultures. Students are able to demonstrate knowledge, skills, and attributes needed to understand diverse local or global contexts.

2. Students are able to critically evaluate the narratives, values, artifacts, processes, technologies or structures that may create a just and sustainable society.

3. Students are able to creatively integrate theory and practice from across disciplines or from experiences outside of the classroom to address complex questions.

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HIST 338  Women&Islam Mid East to 1900  3
HIST 345  West Africa Since 1800  3
HIST 370  Women in Am-Hist Perspective  3
HIST 384  Immigration in America  3
HIST 387  Aspects of the Holocaust  3
HIST 3122  Poland - Study Abroad  3
HIST 3385  Sex, War, and Violence  3
HIST 3502  The Middle East 570 to 1800 CE  3
HIST 3632  The US in the Middle East  3
HIST 3634  History of Islam in the US  3
HIST 3651  Women Leadership/Social Change  3
HIST 3665  Automobile in American Life  3
HIST 3671  Intro to Arab American Studies  3
HIST 3672  Public Cultural Work  3
HIST 3673  Arabs & Muslims in Media  3
HIST 4515  Culture&Hist. in Mod. Iran  3
HUM 300  Intro to AAAS  3
HUM 303  Intro to Women's & Gender Stud  3
HUM 304  Studies in Det.Hist. & Culture  3
HUM 305  The Arts & Culture of Detroit  3
HUM 311  Art of China  3
HUM 312  Art of Japan  3
HUM 313  Chinese Painting  3
HUM 315  Early Chinese Art and Archaeol  3
HUM 335  Women in Medieval Art  3
HUM 358  Shakespeare on Film  3
HUM 388  W. African Music: Trad.&Glob.  3
IMSE 421  Eng Economy and Dec Anlys  3
JASS 336  Film and Music  3
JASS 381  Postwar European Cinema  3
JASS 387  Gender,Sex,Powr Screen Studies  3
JASS 403  Issues in Cyberspace  3
JASS 406  History&Theory of Documentary  3
LIBS 351  Critical Food Studies  3
MCL 381  Postwar European Cinema  3
ME 379  Thermal-Fluids Laboratory  3
ME 4671  Senior Design I  4
ME 4681  ME/BENG Dual Senior Design  4
MHIS 332  Hist of Popular Mus in the USA  3
MHIS 336  Film and Music  3
MHIS 388  W. African Music: Trad.& Glob.  3
MKT 457  Glob Mkting&Consumr Cultre  3
NSCI 325  Gender, Science & Engineering  3
OB 404  Intl Dimensions of Org Behav  3
POL 303  Justice  3
POL 312  Legislative Process  3
POL 325  Environmental Politics  3
POL 334  Organizing and Leadership  3
POL 355  Religion and Politics  3
POL 362  Women, Politics, and the Law  3
POL 385  Israeli-Palestinian Conflict  3
POL 467  Food Politics and Policy  3
POL 487  Comparative Enviro Policy  3
PSYC 303  Intro to Women's & Gender Stud  3
PSYC 394  Psychology and Theater  3
PSYC 405  Gender Roles  3
PSYC 426  Applied Social Psychology  3
PSYC 446  Human Sexual Behavior  3
PSYC 505  Gender Roles  3
PSYC 3955  Diversity and the Workplace  3
RELS 313  African American Religions  3
RELS 327  Gods, Myth and Worship  3
RELS 335  Women in Medieval Art  3
RELS 338  Women&Islam in MidEast to 1900  3
RELS 355  Religion and Politics  3
RELS 393  Black Women, Rel & Spirituality  3
RELS 3634  History of Islam in the US  3
SOC 303  Intro to Women's & Gender Stud  3
SOC 304  Studies in Det.Hist. & Culture  3
SOC 433  Race/Ethnic Health  3
SOC 443  Gender Roles  3
SOC 445  The Family  3
SOC 446  Marriage and Family Problems  3
SOC 473  Race, Crime and Justice  3
SOC 476  Inside Out Prison Exchange  4
SOC 481  Gender and Globalization  3
SOC 4555  Immigrant Cultures and Gender  3
SPAN 450  Hispanic Cinema  3
SPAN 451  Spanish Film  3
STS 301  Concepts of Environmentalism  3
STS 325  Environmental Politics  3
STS 326  Gender, Science & Engineering  3
STS 409  Human Body, Growth & Health  3
STS 430  Medical Anthropology  3
URS 300  Urban and Regional Studies  3
WGST 303  Intro to Women's & Gender Stud  3
WGST 325  Gender, Science & Engineering  3
WGST 335  Women in Medieval Art  3
WGST 338  Women&Islam Mid East to 1900  3
WGST 362  Women, Politics, and the Law  3
WGST 370  Women in America-Hist Perspect  3
WGST 387  Gender,Sex,Powr Screen Studies  3
WGST 393  Black Women, Rel & Spirituality  3
WGST 405  Gender Roles  3
WGST 416  Earl Mod Jpn Paint&Wood Prnts  3
WGST 446  Marriage and Family Problems  3
WGST 455  Gender and Media Studies  3
WGST 466  Arguing Feminism: Rhetoric  3
WGST 471  LGBTQ Literature  3
WGST 473  Arab American Women Writers  3
WGST 476  Inside Out Prison Exchange  4
WGST 481  Gender and Globalization  3
WGST 505  Gender Roles  3
### Capstone Experience [3 credits]

1. Students are able to identify, obtain, research, and describe major issues associated with a specific topic of inquiry.
2. Students are able to identify and discuss critical questions leading to a deeper engagement in the study of a specific topic of inquiry or technology.
3. Students are able to apply knowledge, skills and abilities in the creation and execution of a concrete project informed by specific topic of inquiry.

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Goals for the Undergraduate Experience

Undergraduate education at the University of Michigan-Dearborn is based on the belief that the benefits of academic work are enhanced when classroom and intellectual rigor interact with community engagement and experiential learning. The University of Michigan-Dearborn is uniquely situated to address the complex challenges facing the metropolitan region by offering students rigorous academic offerings as well as the opportunity to apply that knowledge in real-world situations. Our goal is to graduate students who are able to apply theoretical and discipline-specific knowledge to discover creative solutions to problems and to successfully communicate those ideas both individually and as a part of a collaborative effort.

Undergraduate programs at UM-Dearborn provide students with the opportunity to develop particular skills and abilities; to think critically and creatively to solve problems; to cultivate an appreciation of aesthetic and ethical values; and to acquire both breadth of knowledge and the depth of understanding gained through the study of one or more academic disciplines. The UM-Dearborn faculty has a common commitment across units to provide students with foundational knowledge through content-specific courses, extra-curricular activities, and community-oriented experiences.

The goals for undergraduate student learning and experiences at UM-Dearborn are:

- Core Knowledge
- Critical Thinking
- Communication
- Collaboration
- Cultural Understanding
- Citizenship

Goals

1. Core Knowledge

Undergraduate student learning goal #1, “Core Knowledge,” acknowledges that, each discipline at the University of Michigan-Dearborn requires students to gain knowledge of and experience with their chosen academic discipline. Although the content-area goals within each discipline will likely be unique, all degree programs share fundamental educational values that include:

- acquiring rigorous, discipline-specific inquiry skills.
- learning to apply theories to and construct models for addressing real-world problems.
- discussing and producing intellectual work using discipline-specific conventions for writing, research, and communicating.

2. Critical and Creative Thinking

Undergraduate student learning goal #2, “Critical and Creative Thinking,” acknowledges the students’ need to gain experience in problem solving, and to engage in analysis, synthesis and evaluation in creative ways using an ethical framework. Development of such habits of mind will be demonstrated by:

- the ability to seek information and use inquiry to systematically explore situations, collect and analyze evidence, and make informed evaluations.
- the synthesis of knowledge within and across courses and programs and the integration of theory and practice.
- the ability to use qualitative and quantitative reasoning to develop a clear understanding of the problem being studied.
- the generation of creative solutions to problems through original, imaginative, innovative, or artistic effort.
- the ability to use ethical reasoning to generate meaningful solutions to problems.

3. Communication

Undergraduate student learning goal #3, “Communication,” recognizes that there are a wide variety of modes of communication, including written and oral communication that are continually being shaped and expanded through rapid changes in technology. Student mastery of these myriad ways of communicating ideas and intellectual products will be demonstrated through the development of:

- the ability to communicate clearly and effectively to an identified audience both in writing and orally.
- the creation of communication that demonstrates content knowledge, deep reflection, creativity and critical thinking.
- the appropriate use of technology in maximizing the clarity, impact and accessibility of student ideas.

4. Collaboration

Undergraduate student learning goal #4, “Collaboration,” acknowledges that collaborating with peers, faculty and community members is an important part of the learning process in all disciplines. This element in the University's educational plan for students will be promoted by providing students the opportunity to:

- work actively and effectively as part of a team to answer questions and solve problems.
- develop the ability to critically and effectively evaluate the collaborative products and processes.
• grapple effectively with differences and diversity and resolve conflict that occurs in collaborative efforts.

5. Cultural Understanding
Undergraduate student learning goal #5 “Cultural Understanding,” acknowledges that appreciating global and cultural diversity within historical, artistic, and societal contexts is critical to individual and societal success in both professional and personal areas of life. Student achievement in this realm will be gained through:
• reflecting on experiences with diversity to demonstrate knowledge and sensitivity.
• demonstrating awareness of how diversity emerges within and across cultures.
• developing the ability to collaborate in a global setting through awareness of language and cultural differences.

6. Citizenship
Undergraduate student learning goal #6, "Citizenship," recognizes that engagement occurs in many ways for students, and manifests itself in different ways for each academic program and discipline. Active meaningful student involvement in course, community and societal affairs will also encourage student lifelong learning by providing the opportunity to use their skills, abilities and knowledge in a variety of roles and environments. Acquisition of these skills will be promoted through:
• engagement in case-study, scenario analyses and problem solving activities.
• participation in curricular and co-curricular work integral to the metropolitan mission of UM-Dearborn.
• exposure to the diversity, strengths and challenges of the metropolitan community.
• experience in engaging in activities that emphasize the habits of lifelong learning.

Office of Admissions
4901 Evergreen Road
1145 University Center
Dearborn, MI 48128
313-593-5100
313-436-9167 [FAX]
umd-admissions@umich.edu (admissions@umd.umich.edu)
umdearborn.edu/admissions (http://www.umdearborn.edu/admissions/)

Campus Visits/Tours
Visiting campus is the best way to explore what we offer you! The Office of Undergraduate Admissions offers multiple visit options. Choose the one that best fits your schedule by visiting our website at umdearborn.edu/visit (http://www.umdearborn.edu/visit/).

Campus Visit Opportunities
• Discover Dearborn Days: A special campus visit for high school students which includes a presentation and campus tour.
• Transfer Nights: Designed especially for students interested in transferring.
• Daily Campus Tours: Walking tours are given by current students at various times throughout the week. Call 313-593-5100 to make a reservation.

• Individual Appointments: If you prefer a one-on-one meeting with an admissions counselor, appointments are available Monday through Friday and on select Saturdays.
• Group Visits: Group visits (10 or more students in 9th grade or above) can be arranged to include an Admissions informational session and a walking tour led by current students. Other campus offices are available to provide information by request. Please request a group visit at least two weeks in advance. A request form is available online at umdearborn.edu/visit (http://www.umdearborn.edu/visit/).

Degrees & Majors Offered

 Degrees
• Bachelor of Arts, AB
• Bachelor of Business Administration, BBA
• Bachelor of General Studies, BGS
• Bachelor of Science, BS
• Bachelor of Science in Engineering, BSE

 The following undergraduate majors and other fields of concentration offered are shown with the degree designations to which they normally lead:

 Majors
• Accounting (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/accounting/), BBA
• Actuarial Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/actuarial-mathematics/), AB, BS
• Anthropology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/anthropology/), AB
• Art History (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/art-history/), AB
• Behavioral and Biological Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/behavioral-biological-sciences/), AB, BS
• Biochemistry (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/biochemistry/), BS
• Bioengineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/bioengineering/), BSE
• Biological Sciences (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/biological-sciences/), BS
• Business Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/business-studies-secondary-major/) (2nd major only), AB, BS
• Chemistry (A.C.S. Certified) (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/chemistry-acs-certified/), BS
• Chemistry (Instructional) (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/chemistry-instructional-track/), BS
• CIS Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/cis-mathematics/) (2nd degree only), BS
• Communications (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/communication/), AB
• Computer and Information Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/computer-information-science/), BS
• Computer Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/computer-engineering/), BSE
• Criminology and Criminal Justice (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/criminology-criminal-justice/), AB
• Cybersecurity and Information Assurance (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/cyber-security-information-assurance/), BS
• Data Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/data-science/), BS
• Digital Marketing (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/digital-marketing/), BBA
• Economics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/economics/), AB
• Educational Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-education-health-human-services/educational-studies/), AB
• Electrical Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/electrical-engineering/), BSE
• Elementary Certification (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-health-human-services/elementary-school-certification-program/), Certification only
• Engineering Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/engineering-mathematics/) (2nd degree only), BSE
• English (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/english/), AB
• Environmental Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/environmental-science/), BS
• Environmental Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/environmental-studies/), AB
• Finance (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/finance/), BBA
• French Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/french-studies/), AB
• Geological Sciences (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/geological-science/), BS
• Hispanic Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/hispanic-studies/), AB
• History (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/history/), AB
• Individual Program of Study. (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/individual-program-study/) AB, BS
• Industrial and Systems Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/industrial-systems-engineering/), BSE
• Integrated Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/integrated-science/), BS
• Integrative Studies. (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/integrative-studies/) AB, BS
• Instructional Technology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-education-health-human-services/instructional-technology/), AB
• International Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/international-studies/), AB
• Journalism and Screen Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/journalism-screen-studies/), AB
• Management (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/management/), BBA
• Manufacturing Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/manufacturing-engineering/), BSE
• Marketing (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/marketing/), BBA
• Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/mathematics/), AB, BS
• Mechanical Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/mechanical-engineering/), BSE
• Microbiology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/microbiology/), BS
• Philosophy (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/philosophy/), AB
• Physics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/physics/), BS
• Political Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/political-science/), AB
• Psychology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/psychology/), AB
• Reading (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-education-health-human-services/elementary-school-certification-program/reading/), AB, Elementary Certification
• Robotics Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/robotics-engineering/), BSE
• Small Business Management (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/small-business-management/), BBA
• Social Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/social-studies/), AB (College of Arts, Sciences and Letters)
• Sociology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/sociology/), AB
• Software Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/software-engineering/), BS
• Supply Chain Management (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/supply-chain-management/), BBA
• Urban and Regional Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/urban-regional-studies/), AB
• Women's and Gender Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/womens-gender-studies/), AB

Pre-Admission Counseling
Admissions counselors are willing to discuss the educational opportunities available at UM-Dearborn with prospective students. Persons interested in enrollment should arrange a one-on-one appointment by calling the Office of Undergraduate Admissions at 313-593-5100. This includes students in high school or college or anyone wishing to return to school.

Degree-Seeking Student
A student who has been admitted as a freshman or transfer into a regular degree program in an academic unit is called a degree-seeking student. After enrolling, a student may change from one degree program to another by following established procedures, as long as he/she is accepted by the new unit.

Freshman Student Admission

Admission Procedures
UM-Dearborn welcomes applications from prospective freshmen. The admission of all students is on a selective basis; admissions officials consider many factors in reaching individual decisions for admission.

Sources of information used in evaluating a candidate's qualifications include the secondary school record (GPA, rigor of curriculum and trend of grades), comments of the secondary school counselor or principal, scores achieved on either the Scholastic Aptitude Test (SAT) or the American College Test (ACT), and any evidence of special abilities.

Incoming freshmen are expected to present a final official high school transcript as proof of graduating from an accredited high school or preparatory school.

Information provided on the Application for Undergraduate Admission and Scholarships must be accurate and complete. Falsification or omission of information or credentials may result in the revocation of admission.

Application Deadline
It is recommended that students apply for admission online and are eligible to do so as soon as they complete their junior year in high school.

For Winter and Summer 2020, applications will be accepted until the first day of classes. Starting in Fall 2020, the following deadlines apply:

Fall 2020
• Dec. 15, 2019: Submit online application to qualify for Chancellor's Scholarship
• Feb. 1, 2020: Submit online application to qualify for Impact Scholarship
• April 10, 2020: Submit online application and ALL application materials (see above) for admission and to qualify for merit and need-based scholarships
• May 1, 2020: Decision Day (Commit to UM-Dearborn)

Winter 2021 (application available 1/1/20)
• Dec. 15, 2019: Submit online application to qualify for Chancellor’s Scholarship
• Feb. 1, 2020: Submit online application to qualify for Impact Scholarship
• Nov. 30, 2020: Submit online application and ALL application materials (see above) for admission and to qualify for merit and need-based scholarships

Summer 2021 (application available 5/1/20)
• Summer I: April 10, 2021: submit online application and ALL application materials (see above)
• Summer II: Jun. 10, 2021: submit online application and ALL application materials (see above)

Fall 2020, Winter 2021, and Summer 2021
• Priority FAFSA Submission: Jan. 1, 2020

UM-Dearborn continues to accept freshman applications as long as space is available. Students should apply by the dates above to ensure highest consideration for admission.

It is free and easy to apply online (umdearborn.edu/apply (http://www.umdearborn.edu/apply/)), and students may check the application status online.

Official high school transcripts are needed at the time of application for freshman admission. Students seeking admission to UM-Dearborn that took coursework from other institutions of higher learning must also submit official transcripts from all previous institutions. Official corrections made to transcripts by previous schools, whether high schools, colleges, or universities, must be submitted to the University no later than six months after the first day of classes. Students whose final official transcripts are not received will have a hold placed on their student account which prevents course registration for future semesters.

The Admissions staff welcomes the opportunity to meet with prospective students. Appointments should be arranged in advance by calling the Office of Undergraduate Admissions at 313-593#5100.

Admission Requirements
Students interested in enrolling at UM-Dearborn should have completed the Michigan Merit Curriculum as established by the State of Michigan (or equivalent coursework if outside of Michigan). Students graduating from a high school outside of Michigan should pay close attention to the requirements listed below.

A strong high school background in basic academic subjects is important in a student’s preparation for college study. The following college preparatory high school curriculum should be followed:

• College Preparatory English: Minimum four years required.
• Mathematics: Minimum four years required (at least two years must be in college preparatory mathematics).

• Biological and Physical Sciences: Minimum three years required with four years recommended.
• History and Social Sciences: Minimum three years required.
• Foreign Language: Minimum two years strongly recommended.
• Computer Science: At least one semester is required; one year recommended.
• Electives: Additional work in any subjects offered for high school credit to bring the total for the four high school years to the equivalent of at least 15 units.

Special Recommendations
Students who intend to pursue their college work in business administration, computer science, engineering, or physical and natural sciences are encouraged to include the following subjects in their high school preparation:

• Mathematics: Coursework should include two years of algebra, one year of geometry and at least one semester of trigonometry.
• Biological and Physical Sciences: Coursework should include one year of chemistry and at least one year of physics or biological science.

Applicants intending to pursue a college program in science or engineering who have not completed the recommended mathematics and chemistry units may still be admitted if they satisfy the general admission requirements. However, they will be expected to establish proficiency in these areas during their freshman year.

Test Requirements
UM-Dearborn requires all prospective freshmen to submit scores from at least one standardized test: the Scholastic Aptitude Test (SAT) or the American College Test (ACT). The student should make certain that the test results are forwarded to the UM-Dearborn Office of Undergraduate Admissions (SAT code #1861; ACT code #2074).

The results of standardized achievement tests in specific subject areas are not required as part of the application process. However, all new freshmen enrolling at UM-Dearborn, must take the UM-Dearborn English Composition Examination and the Mathematics Placement Examination. These exams are for diagnostic and placement purposes. Placement exams are administered prior to a student’s orientation and class registration.

Advanced Placement (AP)
A prospective student who has exhibited outstanding performance in a particular subject area and has participated in the College Board’s Advanced Placement Program (AP) may be considered for advanced college placement and credit. Such applicants should arrange to have their Advanced Placement Examination reports sent (use our college code of 1861) to the Office of Undergraduate Admissions, where they will be reviewed in accordance with the regulations of the various academic departments. Advanced Placement credit will not be granted when the AP Exam is taken after the student’s official date of high school graduation. For information on the college credit AP practices, visit umdearborn.edu/advancedplacement (http://www.umdearborn.edu/advancedplacement/).

International Baccalaureate
UM-Dearborn grants credit to students based on their IB scores. Students who participated in the IB program in high school should...
University of Michigan-Dearborn 2019-2020

request that their scores be provided to the University for evaluation. Scores of 4 and above are considered for credit.

Enrollment Deposit

In order to guarantee a space in an incoming class, a $50 enrollment deposit should accompany the student’s affirmative reply on the Admissions Acceptance Form, which is sent to the student at the time of admission. The applicant may confirm at any time. For the fall semester, the deadline for deposit is May 1. Upon registration, this deposit will be applied to tuition/fees for that semester. The $50 enrollment deposit is not refundable after May 1 for fall semester admitted students regardless of when the deposit is submitted.

For the winter semester, the deadline for deposit is December 1. For the summer semester, the deadline for deposit is April 1. The deposit is not refundable after the deadline dates.

Online payment of the deposit can be submitted at umdearborn.edu/deposit (http://www.umdearborn.edu/deposit/).

Transfer Student Admission

Admission Requirements

The requirements for admission to UM-Dearborn depend upon the particular program of study to be followed. Admission is based on preparation, ability, and probability of success. All applicants should be in good standing and eligible to return to their previous institution.

Each of the four academic colleges of the University has its own GPA admission criteria:

<table>
<thead>
<tr>
<th>College</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASL</td>
<td>2.50</td>
</tr>
<tr>
<td>COB</td>
<td>2.70</td>
</tr>
<tr>
<td>CECS</td>
<td>2.75&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>CEHHS</td>
<td>2.75&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>1</sup> Students who have completed Calculus II (Math 116 or equivalent) elsewhere with a C grade or higher AND have an overall GPA of 2.75 or higher are admitted directly into their CECS major, all other students with a 2.75 or higher are admitted into pre-engineering.

<sup>2</sup> Several select programs within CEHHS have a 2.50 GPA requirement. Contact the Office of Undergraduate Admissions for more details.

Information provided on the Application for Undergraduate Admission and Scholarships must be accurate and complete. Falsification or omission of information or credentials may result in the revocation of admission.

Admission Procedure

Prospective transfer students are required to submit an application for admission and an official transcript from each college or university previously attended. Failure to list all schools attended on the application may result in revocation of admission. To be considered, official transcripts must come directly from the previous college/university to UM-Dearborn’s Office of Undergraduate Admissions.

The prospective student is responsible for contacting each previous school attended to request that official transcripts be sent. While all transcripts are required for admission, only courses taken at an accredited college or university will be considered for transfer to the University of Michigan-Dearborn. UM-Dearborn uses the Transfer

Credit Practices published by the American Association for Collegiate Registrars and Admission Officers (AACRAO) as a guideline to determine transferability of courses based on accreditation status and other criteria. A list of accredited U.S. and Canadian colleges and universities can be obtained from the U.S. Department of Education website at ope.ed.gov/accreditation.

It is free and easy to apply online (umdearborn.edu/apply (http://www.umdearborn.edu/apply/)), and students can check the application status online.

When the application and all official transcripts have been received, they will be evaluated and the student will be notified regarding admission status.

Transfer students with less than 24 transferable credit hours will be required to submit complete high school records including SAT or ACT scores.

Admission granted while the student is enrolled at another institution is conditional and will become final only when the student meets the conditions set forth in the conditional admission letter and upon receipt by the Office of Undergraduate Admissions of the final official transcript from the student’s former institution(s). It is the student’s responsibility to see that the final transcript is provided to the Office of Undergraduate Admissions following the completion of all courses. Students will not be allowed to register for subsequent terms until the final official transcript has been received.

Official corrections made to transcripts by previous schools, whether high schools, colleges, or universities, must be submitted to the Office of Undergraduate Admissions within six months of the first day of classes of the term of admission.

Application Deadlines:

- Fall: August 22
- Winter: December 22
- Summer I: April 22
- Summer II: June 22

UM-Dearborn may consider completed applications submitted after these deadlines provided time and resources exist to allow for processing, advising, and class registration PRIOR to the start of classes.

Test Requirements

All new transfer students enrolling at UM-Dearborn must take the UM-Dearborn English Composition Examination; the Mathematics Placement Examination must be taken by all new students who plan to take Pre-Calculus or Calculus 1. These exams are for diagnostic and placement purposes. Placement exams are normally administered prior to each registration period.

Transfer of Credits

Students transferring to UM-Dearborn from other two- or four-year institutions can use one or more of these resources below to ensure maximum number of transfer credits.

Course Transfer System

The Course Transfer System (CTS) (umdearborn.edu/cts (http://www.umdearborn.edu/cts/)) is a valuable resource. While it is not an official credit evaluation, the CTS can serve you in determining the
transferability of courses from an accredited community college or four-year school. The information is always current and reflects courses that potentially transfer to UM-Dearborn, but does not necessarily indicate if or how these courses will be used toward your particular degree program.

Transfer Guides
Our Transfer Guides from select community colleges in Michigan outline courses that can be applied to specific majors. To view transfer guides by academic college for community colleges, visit the Transfer Hubs (see below).

Transfer Hubs
Students transferring to UM-Dearborn from a community college located in the metropolitan southeastern Michigan area should check out the customized websites for each of the community colleges. These sites can be accessed at umdearborn.edu/hubs (http://www.umdearborn.edu/hubs/).

Transfer Equivalency Worksheet
At the time of admission, a transfer student will receive a Transfer Equivalency Worksheet. This worksheet reflects only the overall hours potentially transferable to UM-Dearborn, but does not necessarily reflect the hours that will be used toward a degree program. An academic advisor will inform the student as to which hours actually fulfill program requirements. The number of hours that apply to a particular program will determine the number of additional UM-Dearborn hours necessary for degree completion.

Maximum Transferable Credits
<table>
<thead>
<tr>
<th>Previously Attended Institutions</th>
<th>Maximum Transferable Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Y (only)</td>
<td>62</td>
</tr>
<tr>
<td>4Y (only)</td>
<td>75</td>
</tr>
<tr>
<td>2Y &amp; 4Y</td>
<td>75 (62 from 2Y, 75 total)</td>
</tr>
<tr>
<td>UM (only)</td>
<td>90</td>
</tr>
<tr>
<td>2Y &amp; UM</td>
<td>90 (62 from 2Y, 90 total)</td>
</tr>
<tr>
<td>4Y &amp; UM</td>
<td>90 (75 from 4Y, 90 total)</td>
</tr>
<tr>
<td>2Y, 4Y &amp; UM</td>
<td>90 (62 from 2Y, 75 from 2Y+4Y, 90 total)</td>
</tr>
</tbody>
</table>

2Y = 2 year institution  
4Y = 4 year institution  
UM = University of Michigan-Ann Arbor, Flint, or Dearborn

Michigan Transfer Agreement
In the spring of 2014, UM-Dearborn signed the Michigan Transfer Agreement (MTA) to participate as a receiving institution. The program permits transfer students to complete the 30-credit hour MTA at a Michigan community college and transfer it as a block to satisfy most of the general education requirements at Michigan universities.

Students transferring to UM-Dearborn who want to take advantage of the MTA must have the “Michigan Transfer Agreement Satisfied” designation posted on their transcript. An Associate’s degree is not required to use MTA. Students planning for transfer to UM-Dearborn are strongly encouraged to check with their community college to determine what courses are approved for inclusion in the above MTA categories and to learn the details for obtaining an MTA endorsement on their transcript. During the planning and course selection process at the community college, students are encouraged to refer to UM-Dearborn transfer guides to determine which MTA courses would be the best fit in their intended program. Community colleges will have a website for detailed information including approved courses for completing the MTA. Additional information can be found at: umdearborn.edu/mta (http://www.umdearborn.edu/mta/).

Credit for Education in the Armed Forces
Effective Fall 2015 for new admits, veterans who have served in the armed forces may receive 2-6 general credits toward degree for their recruitment training if an honorable or general discharge was granted. The hours granted vary according to the ACE recommendations for credit based on the military branch of service. Additional Specialist Training credit may be petitioned for credit via a written petition during the first semester on campus. Veterans should meet with their academic unit to discuss possible options, write a petition, and arrange to meet with a discipline representative or department chair to review the military course work and experience. Based on the discussion and ACE recommendations, specific credit would be granted in the first semester after admission by the discipline representative or department chair through the academic unit advising office.

UM-Dearborn has a cap of 62 transfer hours from an accredited community college. The same cap is applied for all ACE credits. This includes the general credit granted for recruitment training for veterans. If a veteran attended the Community College of the Air Force the cap of 62 hours toward degree includes the general credits, attendance at the Community College of the Air Force and all petitioned credit to degree.

Admission to the Honors Program
The Honors Program at UM-Dearborn is designed for qualified, highly-motivated students who want an extra level of challenge and stimulus in their college experience. Honors students take a special sequence of classes that satisfy basic requirements and, at the same time, provide a well-balanced undergraduate education. The program teaches students to think critically and independently, to perceive connections between diverse areas of knowledge, and to express their thoughts clearly and effectively. Honors Program classes are small, enabling students to interact closely with the faculty and each other.

Admission to the program is competitive and is based on the student’s interests and experience as well as the high school record. Students admitted with distinction (at least a 3.50 recalculated GPA and at least a 1200 total SAT score or a 25 ACT composite score) will be contacted to schedule an interview for the Honors Program.

For more information, visit umdearborn.edu/casl/sp_honorsprog (http://umdearborn.edu/casl/sp_honorsprog/).

Personal Enrichment
Personal Enrichment (PE) is an admission status that enables students to enroll in undergraduate courses for the purpose of personal or professional development.

Eligibility
- Students must have already earned a baccalaureate degree and not be seeking an additional undergraduate degree.
Students in this category are subject to the following policies:

- A PE student may enroll for a maximum of 15 credit hours at the University. There is no limit on the number of semesters, but the total number of completed credit hours for all semesters enrolled may not exceed 15.
- A PE student may apply no more than 15 credit hours accumulated at UM-Dearborn to a degree program. Exception is possible only by written permission of the academic dean of the unit to which the student has applied.
- A PE student is limited to enrolling for nine credit hours (not to exceed three courses) in a single four-month term (four hours per half-term).
- A PE student with a grade point average (GPA) less than 2.0 should visit the Office of Student Success before registering for a subsequent term. The student will normally be put on probation. If academic performance persists below a 2.0 cumulative grade point average (GPA), the student may be required to withdraw from the University.
- A Personal Enrichment student will have fees assessed and adjusted by fee regulations identical to those governing regular matriculated students. All courses taken under PE status are considered part of the undergraduate record.

Requirements for Admission to a Degree Program

Prospective Degree Students have a special status at UM-Dearborn and are eligible to be considered for financial aid for up to 12 consecutive months before admission to a regular degree program. If a student is not admitted to a regular degree program at the end of the 12 consecutive months, the student is not eligible for additional financial aid.

Students who wish to request additional information should call the Office of Admissions and Orientation at 313-593-5100.

Prospective Degree Student

The Prospective Degree Student (PDS) program provides an opportunity for an individual whose previous high school and/or college work does not qualify for admission as a degree-seeking student to enroll in undergraduate courses.

Eligibility

- Students who are at least five years beyond high school graduation (or beyond last high school attendance for applicants with a GED)

or

- Students who are at least five years beyond high school graduation, have completed some college coursework and have not been enrolled in college for at least two years.

Students in this category are subject to the following policies:

- Prospective Degree students will enroll in 14-16 UM-Dearborn credit hours toward a degree as a non-degree student. Students may take additive credits with the approval of an academic advisor, but these credits are not used in determining eligibility for degree-seeking status nor will they be applied toward a degree.
- Upon completion of 14-16 credit hours, students will apply for admission to a degree program. A maximum of 16 credit hours may be accepted by the academic unit as credit toward a degree.
  These credits must be at the 100-level or above and fulfill degree requirements.
- Prospective Degree students will be advised through the START Office.
- Upon being admitted, the student must call 313-593-5576 to schedule an advising appointment prior to registering for classes.
- Coursework in the PDS program must be completed within one full academic year (3 semesters) of admission.
- Students are responsible for taking all necessary placement exams in advance of, or within, the first semester of enrollment.
- A PDS student will have fees assessed and adjusted by fee regulations identical to those governing regular matriculated students. All courses taken under PDS status are considered part of the undergraduate record.

Financial Aid Eligibility Limitations

Prospective Degree Students have a special status at UM-Dearborn and are eligible to be considered for financial aid for up to 12 consecutive months before admission to a regular degree program. If a student is not admitted to a regular degree program at the end of the 12 consecutive months, the student is not eligible for additional financial aid.

Requirements for Admission to a Degree Program

During the final semester of PDS coursework, student are encouraged to apply for admission as a degree-seeking student and work closely with their START adviser regarding next steps. The application process includes submitting the Application for Admission and all required official transcripts and documents. Each of the four academic colleges has its own admission criteria:

- **College of Arts, Sciences, and Letters (CASL):** 2.50 cumulative GPA for PDS coursework at UM-Dearborn.
- **College of Business (COB):** 2.70 recalculated GPA, including PDS coursework at UM-Dearborn. If the student has attended other colleges/universities, the GPA is recalculated to include only courses which are potentially transferable.
- **College of Engineering and Computer Science (CECS):** 2.75 recalculated GPA, including PDS coursework at UM-Dearborn. If the student has attended other colleges/universities, the GPA is recalculated to include only courses which are potentially transferable. In addition, the GPA for math, science, and engineering courses will be recalculated, a 2.75 is required for each.
- **College of Education, Health, and Human Services (CEHHS):**
  - 2.75* for Education programs
  - 2.50* for Community Health Education, Child Life, Children & Families, Health and Human Services, and Instructional Technology programs

*recalculated GPA, including PDS coursework at UM-Dearborn. If the student has attended other colleges/universities, the GPA is recalculated to include only courses which are potentially transferable.

Alumni Enrichment Program

The Alumni Enrichment Program is an opportunity for UM-Dearborn alumni to enhance their education and to provide additional exposure to a variety of subject areas on a non-credit basis. Each alumni’s selection of courses will be checked to ensure that the educational-broadening objective of this program is being faithfully pursued.

All courses must be taken on a pass/fail basis.
Eligibility

This program is available to UM-Dearborn alumni only. Upon acceptance, students are eligible to elect up to 9 hours per term of undergraduate course work in one or more fields distinctly different from the field in which they earned their bachelor’s degree (major or minor).

Undergraduate and graduate alumni from UM-Dearborn may pursue undergraduate courses. They are eligible to participate in the program one full term after graduation has been confirmed. Alumni participants are not eligible if currently enrolled in a degree or certificate program.

Course enrollments will occur on a space available basis. Alumni in this program will also have to meet the regular prerequisites for any courses they elect. Internship, cooperative education, and online courses are not available to program participants.

Assessment

A discounted per credit hour charge will be levied as an "enrollment fee." This means that a portion of the tuition will be covered by an Alumni Scholarship. The Alumni Enrichment student will also be expected to pay any fees associated with registration, course elections, and technology.

To Apply

Apply online at umdearborn.edu/otheradmission. Once admitted, students will be allowed to register for classes. For further information, contact the Office of Undergraduate Admissions at 313-593-5100.

Guest Students

A guest student is a regular degree student in good standing at another institution who is admitted to UM-Dearborn for one term only. Work completed under such an arrangement is considered to be a part of the student's program elected under the jurisdiction of the home institution.

Admission is by means of the Michigan Uniform Guest Application certified by the home institution, and a completed addendum to the application available at umdearborn.edu/guest-addendum. The Guest application deadline for any term is the first day of class of that term.

Guest students are expected to receive academic advising from their home institution, although guest students are subject to all rules governing course prerequisites.

Enrollment is limited to a maximum of four semesters. A new application is required for each semester they wish to enroll. If a guest student has previously taken classes at UM-Dearborn, the admission decision will also be based on the UM-Dearborn GPA.

If there are prerequisites for any courses elected, the student is required to submit a copy of the home college/university’s transcript to verify that all requirements have been fulfilled and receive the necessary overrides prior to registration.

UM-Dearborn students wishing to elect courses at another institution of higher education should see "Coursework at Other Institutions (https://umdearborn.edu/students/registration-records/taking-courses-outside-um-dearborn/)".

Dual Enrollment Programs

High School Dual Enrollment

Dual enrollment provides an opportunity for high school students with demonstrated academic potential to enroll in selected UM-Dearborn courses while completing their high school graduation requirements.

The purpose of the program is to supplement and enrich the educational experience by allowing students to pursue course work which otherwise would not be available. Admission as a dual enrolled student is a special non-degree status. Students are expected to complete all graduation requirements mandated by his/her high school. Although students are admitted with a special status, they are granted full privileges of UM-Dearborn students, including use of the library and recreational facilities and the opportunity to purchase student tickets to cultural and athletic events at the University of Michigan. After graduation, admission to a degree program at the University will be granted provided they meet the minimum admission criteria. Dual enrollment students may enroll for a maximum of eight credit hours per semester.

Admission Criteria

<table>
<thead>
<tr>
<th>Current Class Criteria</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seniors</td>
<td>3.0+ posted GPA on HS Transcript</td>
</tr>
<tr>
<td>Juniors</td>
<td>3.5+ posted GPA on HS Transcript</td>
</tr>
<tr>
<td>Sophomores and Freshmen</td>
<td>3.90+ posted GPA on HS Transcript</td>
</tr>
<tr>
<td></td>
<td>Personal Interview with Admissions Representative to measure maturity level and preparedness for college coursework.</td>
</tr>
<tr>
<td></td>
<td>A typed personal statement (up to 500 words) clarifying the student’s interest in and commitment to taking college-level course(s) - to be submitted at the time of interview</td>
</tr>
<tr>
<td></td>
<td>Optional: provide any additional assessment scores if available (i.e. Explore, Plan, ACT, Compass, MME, PSAT, SAT, or Accuplacer)</td>
</tr>
</tbody>
</table>

To Apply for Admission

Apply as early as possible. The deadline for all documents is June 15 for the fall semester and November 1 for the winter semester. No application will be processed until all of the following have been completed and received:

1. The Dual Enrollment application.
2. Course Permission and Calculation Worksheet. Be sure to select alternative courses. Must be signed by your high school principal.
3. An official transcript (including test scores, if applicable).
4. Personal Statement (freshmen or sophomores only).
Orientation and Registration

Students will be notified of their admission status by the Office of Undergraduate Admissions and information about orientation and registration will be mailed to you after you are admitted. Admission to dual enrollment status does not guarantee the ability to enroll in the class(es) specified on the Course Permission and Calculation Worksheet, but every effort will be made to accommodate the student’s request. As a dual enrollment student you may enroll for a maximum of eight credit hours per semester.

Note: Students must receive a grade of C or higher in dual enrollment course(s) at UM-Dearborn to be eligible to register for the next semester. Students who receive below a C grade will be contacted by the Dual Enrollment Coordinator after grades are posted. Students must submit a new application for each semester they wish to enroll.

Students planning to register for an English Composition, Mathematics, or an advanced Foreign Language placement course must take the appropriate placement exam (https://umdearborn.edu/admissions/undergraduate/admitted-students/orientation/placement-exams/current-and-non-degree-student-placement-exams/) prior to registration.

The dual enrollment application can be found online at umdearborn.edu/otheradmission/ (http://www.umdearborn.edu/otheradmission/).

Readmit

An undergraduate student (that is, a candidate for a bachelor’s degree) who does not register for any courses at UM-Dearborn during a 12-month period must be formally readmitted in order to resume studies at UM-Dearborn. Such a readmitted student is then governed by the current Catalog.

Some academic units at UM-Dearborn may have more stringent regulations. It is the obligation of students who leave the University for an extended period of time to acquaint themselves with the specific requirements.

Since all I and X marks are permanently changed to IE and XE after four months, a readmit may not petition to make up I's or X's on his/her prior record.

Courses taken at other campuses will not count automatically toward graduation. Students should petition their academic unit for credit(s). Maximum transfer hours apply (see “Transfer Equivalency Worksheet” section).

Readmitting students complete a Readmission Form available to download at umdearborn.edu/ddc (http://www.umdearborn.edu/ddc/) and submit it directly to the academic unit in which they wish to enroll. Readmitted students are subject to the requirements in effect at the time of readmission. If students want to change their program of study, they should contact the academic unit of the program to which they would like to change.

Deferring Admission

Students who have been admitted but did not enroll may defer admission up to one year. After that, a new admissions application must be submitted.

To defer admission, students complete an Admission Information Change Form available to download at umdearborn.edu/ddc (http://www.umdearborn.edu/ddc/) and must disclose if there has been or will be any enrollment at another school prior to the new deferred semester. Failure to disclose this information may result in the revocation of admission.

Teacher Certification

The College of Education, Health, and Human Services at UM-Dearborn can assist qualified persons who hold a bachelor’s degree from an accredited institution to pursue a program of study leading to a recommendation for a Michigan Standard Teaching Certificate-Elementary (COE) or Secondary (COS).

Initial Teacher Certifications

Certificate-Only Elementary Program (COE), Certificate-Only Secondary Program (COS)

A student who already holds a bachelor’s degree from an accredited institution is able to earn a Michigan Elementary or Secondary Provisional Teaching Certificate through one of our “certification-only” programs. Completers of these programs are prepared to be competent, caring and reflective educators who are ready to teach in their chosen teaching area.

Requirements for COE and COS Provisional Teaching Certificates:

- Bachelor’s Degree with a cumulative GPA of a 2.75 posted*
- Certification-Only Application
- SAT

Programs for Certified Teachers

Professional Education Certificate (PEC)

Upon expiration of the Michigan Provisional Teaching Certificate, teachers are required by state law to secure a Professional Education Certificate in order to retain a valid teaching credential. The College of Education, Health, and Human Services offers this program for teachers seeking to earn a Professional Education Certificate or first or second renewal of their Provisional Teaching Certificate.

Enhancement Program (EP)

The College of Education, Health, and Human Services offers this program for teachers who currently hold a Michigan Permanent, Continuing or Professional Education Certificate and wish to enhance their certificate with an additional area of preparation or endorsement.

Requirements for PEC and EP:

- Bachelor’s Degree with a cumulative GPA of a 2.75 posted*
- Application
- Copy of Current Teaching Certificate
- Active State of Michigan Teaching ID

Second Degree

Applicants pursuing a second Bachelor’s degree must submit the Application for Undergraduate Admission and Scholarships and meet the same admission requirements as transfer students. Each of the four academic schools and colleges of the University have their own admission criteria:
Retired Persons Scholarship Program

The Retired Persons Scholarship Program (RPSP) offers retirees the opportunity to attend classes alongside traditionally-aged students. The integration of younger students and older students into the mainstream academic curriculum bridges the generational gap. A limited number of Retired Persons Scholarships for undergraduate and graduate study are available at UM-Dearborn.

Prospective students are required to:

- have reached their 60th birthday prior to the semester of their first registration under this program.
- have graduated from high school and have the potential to succeed at college-level studies.
- be a "retired person" to have no current career or employment.

Registration

Given the intellectual enrichment nature of the RPSP program, students enrolled in it will register under the Non-Candidate for Degree (NCFD) option. RPSP students should consult the campus’ graduate and undergraduate academic policies for the number of credit hours allowed under the NCFD option. NCFD policies cannot register for internship and co-op courses. In addition, students will be permitted to register only after degree-seeking students as specified in the Registrar’s Registration Timetable.

Academic Credit

Students enrolled in the RPSP program can only take courses under the audit option. It is important that students considering a degree at the university not enroll under the RPSP program, as courses taken under the audit option do not carry academic credit and are not transferable into a degree program.

For more information, visit umdearborn.edu/rpsp (http://www.umdearborn.edu/casl/rpsp/). Applications are available at umdearborn.edu/ddc (http://www.umdearborn.edu/ddc/) or in the Office of Undergraduate Admissions.

International Admission

Application deadlines for students residing outside the U.S.:

For the fall semester - students outside the U.S. (Freshman)  April 10, 2020
For the fall semester - students in the U.S. (Transfer)  July 30, 2020
For the fall semester - students outside the U.S. (Transfer)  July 1, 2020
For the winter semester - students in the U.S. (Freshman and Transfer)  November 30
For the winter semester - students outside the U.S. (Freshman and Transfer)  November 1, 2020
For the summer semester (Freshman and Transfer)  Summer enrollment not advised for entering International students

Students from other countries are welcome to apply for admission to the University of Michigan-Dearborn. The following documents must be received before an admissions decision can be made:

Application for Undergraduate Admission

- You may submit your application first, and send additional materials afterwards; however a complete packet with all necessary application components will expedite the admissions decision. All correspondence must be in English, and must contain the full name of the applicant with the family surname underlined. Applications will not receive a final evaluation until all required materials have been received.
- If you are already in the U.S. studying on an F-1 or J-1 visa, please indicate F-1 or J-1 on the "Type of Visa" section on the Application for Undergraduate Admission.
- Students who plan to obtain an F-1 or J-1 visa from abroad for use in entering the U.S. should write "plan to obtain F-1 or J-1 visa" in the "Type of Visa" section on the Application for Undergraduate Admission.
- If you are currently in the U.S. as a refugee, asylee, or on a temporary visa other than the F-1 student visa (such as F-2, B-2, H-4, etc.), and you wish to change to F-1 status to begin attending UM-Dearborn, please indicate this on your Application for Undergraduate Admission.

Transcripts from previous high schools or colleges attended

Freshmen

All freshmen must submit official transcripts for all years of secondary school work completed (U.S. and abroad). If your secondary school work has been completed in a country which has national standardized examinations, you must also submit official certificates showing results of these examinations ("O" or "A" levels, Baccalaureate, Standard X and XII, etc.).

Transfer Students

Transfers must have official transcripts sent to the Office of Undergraduate Admissions from all post-secondary institutions attended. Transfer students must provide proof of secondary school completion (diploma, final transcript, leaving certificate, examination certificate, etc.), but are usually not required to provide records from all years of secondary school. However, you must provide complete records if you have attended college for less than one year of full-time study.
Academic Records from outside of the U.S.
Translations are required for all documents and transcripts not originally in English. These translations are the responsibility of the student and must be complete, word-for-word, and in the same format as the original document. You must submit both the original document and the translation to the Office of Undergraduate Admissions.

If you have attended high school or a college/university outside the U.S., you must also submit transcripts from all institutions you have attended outside the U.S. to Educational Credential Evaluators (ECE) for a course-by-course evaluation (ece.org). ECE requires that you submit records from your last year of secondary school along with your college or university records. The evaluated record(s), translation(s), and original transcript(s) in the native language must be sent to the Office of Undergraduate Admissions from the official source.

English Language Proficiency Requirements
If you are not a native speaker of English, you must prove an adequate level of English language proficiency to enroll in college credit courses, even if you are currently a U.S. citizen or permanent resident and regardless of how long you have resided or been educated in the U.S.
You must fulfill the English language proficiency requirement in one of the ways described below before regular admission will be granted.

Freshmen may prove their English Language Proficiency without additional testing by:

• completing two full years of general track English courses in a U.S. high school with grades of “C” or better and
• achieving an acceptable score on the verbal section of the SAT or ACT. There is no specific SAT/ACT verbal score required, but this score will be used in conjunction with other factors to evaluate your academic English skills.

Transfers may prove their English proficiency without additional testing by:

• presenting acceptable performance as described in the freshmen section above. You must provide records to verify acceptable courses, grades, and SAT/ACT scores, or completing two semesters of regular-track, transferable English composition courses, equivalent to UM-Dearborn’s Composition 105 and 106, with grades of “C” or better in both courses (“C-” or below is not acceptable for transfer).
• If you are enrolled in the second semester of English composition when applying and earn a “C” or better in the first semester of English Composition, conditional admission may be possible.

If you have not demonstrated English language proficiency in one of the ways described above, you must take an English language proficiency test. The Office of Admissions and Orientation will accept the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) Examination. You must take one of these tests (it is not necessary to take both). These tests are available throughout the world, and should be taken well in advance of the intended starting term.

The minimum score required for admission is dependent on the test you take. Achieving the minimum score does not guarantee admission, only consideration.

Minimum Scores

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Minimum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOEFL: Paper-based</td>
<td>550</td>
</tr>
<tr>
<td>TOEFL: Computer-based</td>
<td>213</td>
</tr>
</tbody>
</table>

The TOEFL and IELTS are offered throughout the world. You should take a test well in advance of your intended starting term. TOEFL scores arrive at UM-Dearborn 6-8 weeks after the test date. IELTS mails results 13 days after the test date.

You may take the TOEFL, or IELTS test more than once, and all scores will be considered. Test scores more than two years old will not be accepted for consideration. For testing information and registration materials, please contact:

TOEFL
P.O. Box 6151
Princeton, NJ 08541, U.S.A.
Telephone: 609-771-7600
toefl.org (http://www.toeflgoanywhere.org/)
toefl@ets.org (http://www.toeflgoanywhere.org/)

IELTS
100 East Corson Street, Suite 200
Pasadena, CA 91103, U.S.A.
Telephone: 626-564-2954
ielts.org (http://www.ielts.org)
ietlts@ieltsintl.org (http://www.ielts.org)

UM-Dearborn offers English as a second language courses. For information, please call the English Language Proficiency Program Office at 313-583-6661.

Standardized test requirement
All freshmen are required to take a U.S. standardized college entrance examination, regardless of your citizenship/visa status or whether you have attended secondary school in the U.S. or abroad. Transfer students are not required to take this exam if they have earned at least 24 transferable credits. If for any reason, students are unable to provide a standardized exam result, the student should contact the Office of Admissions and Orientation immediately.

• The Office of Admissions and Orientation will accept either the SAT (Scholastic Aptitude Test) or the ACT (American College Test). The student should make certain that the test results are forwarded to the UM-Dearborn Office of Undergraduate Admissions (SAT code #1861; ACT code #2074). You must take one of these tests (it is not necessary to take both). These tests are available throughout the world, and should be taken well in advance of the intended starting term. SAT and ACT scores take 6-8 weeks after the test date to arrive at UM-Dearborn. You may take the test(s) more than once, and UM-Dearborn will consider your highest composite score.
• Your score will be used as one factor in the admissions process. If your secondary education has been completed partially or entirely abroad, and if English is not your native language, your individual circumstances will be considered when evaluating your test scores.
• For students with international backgrounds, the score required for admission in each case will depend on various other factors, such as high school courses and grades, and English proficiency test scores (if required).
• For information and registration materials for the SAT or ACT, please contact your high school counselor if you are in the U.S., or contact the testing agencies directly if you are currently living abroad:
Academic Requirements for International Admission

This section discusses grade-point average (GPA) and course/curriculum requirements.

Freshmen

Freshmen who have attended secondary school abroad are expected to meet the same general admissions requirements as U.S. students.

1. You must have earned a U.S. high school diploma or the equivalent secondary school completion credential in your country, by the time you would enroll at UM-Dearborn. Freshmen usually apply during their last year of secondary school. Any offer of admission is conditional upon successful completion of the secondary school program before enrollment at UM-Dearborn.

2. You must have pursued a general academic (non-vocational) program of study. Solid preparation in the traditional academic college-preparatory subjects is required (English, mathematics, science, social studies).

3. You must have maintained above-average grades throughout your secondary school studies. Admission is competitive, and to be a strong candidate for admission, grades received should be equivalent to an overall GPA of 3.0 on a 4.0 U.S. scale. If you complete your secondary schooling abroad, please contact the Office of Undergraduate Admissions for information on the credential and level of performance which would be acceptable for admission.

Transfer Students

The Office of Undergraduate Admissions will evaluate transcripts from all institutions attended as well as ECE or WES evaluations for foreign schools.

General academic requirements for each unit are listed below. You should contact the Office of Undergraduate Admissions as early as possible in your academic career to be certain that you are completing courses that will not only transfer, but also count toward specific admission and/or graduation requirements at UM-Dearborn. All GPA requirements are given using the 4.0 U.S. scale.

All transfer applications are reviewed on an individual basis, and if you do not meet the stated requirements for your desired unit, it is suggested that you discuss your situation with an admissions counselor. Call 313-593-5100 to schedule an appointment.

- College of Arts, Sciences, and Letters
  Required GPA: 2.50
- College of Business
  Required GPA: 2.70
- College of Engineering and Computer Science
  Required GPA: 2.75
- Other requirements: Students who have completed Calculus II (Math 116 or equivalent) elsewhere with a C grade or higher AND have an overall GPA of 2.75 or higher are admitted directly into their CECS major; all other students with a 2.75 or higher are admitted into pre-engineering.

- College of Education, Health, and Human Services
  Required GPA: 2.75*

*Several select programs within CEHHS have a 2.50 GPA requirement. Contact the Office of Undergraduate Admissions for more details.

How to obtain I-20 or DS-2019

Please reference the Office of International Affairs website at umdearborn.edu/io_international-undergrad-adm/ (http://www.umdearborn.edu/io_international-undergrad-adm/). All documents received by the Office of Undergraduate Admissions will be shared with the Office of International Affairs for the purpose of creating the I-20 or DS-2019.

Effective July 1 2017, the University will use an express delivery service, via University Express Mail Services (UEMS) eShipGlobal (http://study.eshipglobal.com/), to send Form I-20 or DS-2019 to admitted international students and any students who would like to request Form I-20 or DS-2019. This safe, quick, and dependable delivery service allows you to pay for, track, and receive your documents.

You will need:

- UMID Student ID (8 digit number), if available
- Your mailing address
  - You may request shipment either to your foreign address, or to a U.S. address.
  - If your requested documents will be sent to a U.S. contact address, please include the name of the person who lives at that address
- Your email address
- Your phone number
- Your credit card information (Visa, Mastercard or Discover cards only). The cost of this service will vary by country, ranging between $45 and $95 USD.

The Office of International Affairs (OIA) will receive notification that you have paid for your documents to be sent by express mail and this will trigger next steps.

If you are near Dearborn, arrangements can be made to pick up your immigration documents directly from OIA (https://umdearborn.edu/offices/international-affairs/).

Using Express Mail (eShipGlobal)

The UEMS website works best with Internet Explorer and Mozilla Firefox browsers. Do not go through other shipping sites like DHL, FedEx or UPS directly. All communication will go through the UEMS eShipGlobal service.

If you experience any difficulty in registering and processing the shipment, please use the eShipGlobal/UEMS “Help” link for step by step instructions. If you have additional questions about how to use this service, please review their Frequently Asked Questions...
Requesting Documents

Register and activate your account at University Express Mail Services (https://study.eshipglobal.com/). Registration and activation of your account is free.

Download printable instructions (https://umich.box.com/s/z09lim2y4t8gw266shhilg3bwkp84nf8/).

1. Once logged in, click the “Receive documents from your University” option.
2. Type “University of Michigan-Dearborn” in the search box, or select it from the drop down list.
3. Once “University of Michigan-Dearborn” has been selected, click “Continue.”
4. Select the specific university department “Office of International Affairs” and then “Continue.”
5. Complete the shipping form, using your student ID, and select “Ship/Quote.”

Note: PO Box addresses are generally not preferred by express carriers. If entering a PO Box address, be sure to provide the complete physical address where the PO Box is located in order to avoid delays or failed shipment.

1. On the confirmation page, check your shipment details.
2. On the same page, complete the credit card information form.
3. Select “Confirm” to advance to the shipment summary page.
4. UM-Dearborn will automatically be notified by University Express Mail Services (eShipGlobal) that you have requested your documents via express mail. You can track the shipment using the tracking number provided.
5. Receive your documents in 3-5 business days from the date of mailing.
6. Students will receive:
7. A notification from the OIA stating the student’s I-20 or DS-2019 has been processed.
8. Email confirmation from eShipGlobal that their packet has left the university and is on the way.

Note: Any delays or non-receipt of packets should be directed to student.support@eshipglobal.com. The OIA does not receive any shipping information once the packet is picked-up from the office.

Admissions Committees

The Admissions Review Committee meets regularly to review borderline admission cases and other unique admission circumstances.

The Conduct Review Committee is comprised of individuals from offices across campus, and reviews applicants with academic or criminal conduct history.

Orientation

The START Office conducts orientation programs for newly admitted freshmen, transfer students, and parents of incoming students. These programs focus on academic expectations, requirements at UM-Dearborn, and various aspects of campus life. The programs also make students aware of existing services available to them: counseling; tutoring; academic advising; life/work planning; and social and cultural activities. Registrations for a student’s first semester of classes takes place at Orientation. The orientation program for parents of new students acquaints them with the organizational and programmatic structure of the University. Once admitted to the University, each student will receive information about Orientation. It is expected that all new students, freshmen and transfers, will attend Orientation. Questions may be directed to the START Office by calling 313-593-5576.

Placement Exams

Newly admitted students will take one or more placement exams. Placement exams are used to assess the level of class into which a student should enroll. Placement exams should be taken well in advance of orientation or meeting with academic advisor. Placement exams in English, Mathematics, and Foreign Language are offered. Placement exams are not used as a basis for awarding credit.

Financial Aid & Scholarships

Office of Financial Aid and Scholarships
4901 Evergreen Road
1183 University Center
Dearborn, MI 48128-2406
313-593-5300
313-593-5313 [FAX]
umd-ask-oaf@umich.edu
umdearborn.edu/financialaid (http://umdearborn.edu/financialaid/) Federal Title IV School Code: 002326

It is the goal of the University of Michigan-Dearborn that no student should be denied an education because of limited financial resources. To meet this goal, the university maintains programs of grants, scholarships, loans, and part-time employment for eligible students who are accepted and enrolled in the university as a degree-seeking student in good standing.

Available Financial Assistance

There are three types of aid available through a single application (the Free Application for Federal Student Aid or FAFSA (https://fafsa.gov/)): grants, loans, and employment. Most assistance is offered as a package of two or more kinds of aid. Most financial aid sources require a minimum of at least half-time enrollment (6 or more credit hours per semester) in coursework that counts toward degree requirements.

Undergraduates (pursuing their first bachelor’s degree) are considered for grants, loans, and work-study employment, according to their eligibility and preference. Students pursuing a second bachelor’s degree are limited to loans and work-study employment.

Admission into an eligible program of study (i.e., a degree-granting program) is primary criterion to receive financial aid funding. All Personal Enrichment, English Proficiency, and Non-Candidate for Degree status students are ineligible for financial aid. Most Guest, Prospective Degree status, and Alumni Enrichment students are ineligible for financial aid – however, there are limited exceptions which may be applicable to specific situations. Students admitted via Guest, Prospective Degree, or Teaching Certificate status should come in to talk with a Financial Aid Officer to discuss their specific admission status and financing options.
Determining Need

How eligibility for need-based aid is determined

Financial aid programs were created with the assumption that the primary responsibility for paying for college rests with students and their family. Need-based financial aid is available to families demonstrating a need for additional resources. The formula used to determine whether you are eligible for need-based aid is:

\[
\text{Financial Aid Eligibility (Need)} = \text{Cost of Attendance/Budget} (\text{COA}) \quad - \quad \text{Expected Family Contribution} (\text{EFC})
\]

Cost of Attendance/Budget (COA)

= Expected Family Contribution (EFC)

EXPECTED FAMILY CONTRIBUTION (EFC): is derived from a formula applied uniformly to all aid applicants and considers the financial information provided on the Free Application for Federal Student Aid (FAFSA). The FAFSA determines eligibility for federal, state, and UM-Dearborn gift aid.

The EFC is made up of two parts:

1. The Parent Contribution – This is what your parents are estimated to be able to pay toward annual college costs, based on their income and assets (cash, checking, savings, and money market accounts; investments and real estate holdings; and business equity). Allowance for living expenses (based on family size), taxes paid, number of siblings in college, and retirement asset protection are built into the formula.

2. The Student Contribution – This is what you are estimated to be able to pay based on your income, percentage of savings, and other assets.

Your EFC is determined early in the process of assessing your financial need and, unless your financial circumstances change significantly, your EFC remains constant. Some financial aid programs can assist students and parents in replacing the EFC.

SCHOLARSHIPS AND OTHER FINANCIAL RESOURCES: are funds you may receive from sources outside your family, including private scholarships, merit scholarships, UM-Dearborn school or college scholarships, ROTC scholarships, benefits you or your parent have earned through military service or other employee benefits, awards and scholarships from your state and prepaid tuition plans.

How need-based aid is awarded:

We determine your eligibility for need-based aid by taking your Cost of Attendance and subtracting your Expected Family Contribution and other financial resources. We first award federal, state (if you are eligible), and University grants and scholarships, such as Federal Pell Grant, Michigan Competitive Scholarships, and Chancellor’s Scholarships. We then determine University gift aid eligibility based on total gift aid, EFC and applicants who apply by the established deadline dates. Applicants with financial need beyond grants and scholarships are then awarded Federal Direct Loans and the Federal Work-Study program, which are awarded to students with need.

We attempt to distribute grant and Work-Study funds equitably among the population of all eligible applicants who apply by established deadline dates. Awards are determined by a combination of demonstrated financial need, federal award maximums and available funding, among other factors.

Because Federal Supplemental Educational Opportunity Grant (FSEOG) funds are limited, they are awarded only to applicants with the most need.

A note about scholarships and other resources:

Students may seek private scholarships and get help from UM-Dearborn schools and colleges to meet their college costs. They may also use resources, such as ROTC scholarships, and veterans’ benefits. According to federal regulations and/or university policies, these are considered as financial resources when determining eligibility for need-based aid. However, they will improve your overall aid package. In general, if you receive outside aid:

• It will first be applied against costs not accounted for in your financial aid package (i.e. the gap between the Cost of Attendance and your EFC plus the aid offered). Outside aid will not reduce your EFC.

• Next, it will reduce your loan or Work-Study award, reducing funds you must borrow or earn by working.

• Your grant aid will be reduced if all loan and Work-Study awards are replaced by scholarships or other resources.

Some important exceptions to this rule:

• Some Office of Financial Aid scholarships are awarded based on student need. This may reduce your UM Grant, but your total aid should remain the same or be higher. Your total aid should not be reduced. If you are awarded one of these, you will receive a letter.

• If the student owns a 529 plan, such as a Michigan Education Trust contract, receive a post-9/11 VA benefit, or if you receive a State-funded scholarship such as the Michigan Competitive Scholarship, Detroit Compact Scholarship, Wade McCree Scholarship, Kalamazoo Promise, or Detroit Promise, it will be applied against your need-based grants before reducing your loan or Work-Study.

• Receiving a HAIL Scholarship, Wade McCree, Detroit Compact, or Detroit Promise scholarship may reduce your eligibility for university-funded scholarships and for the Michigan Competitive Scholarship. Students receiving a full tuition Chancellor’s or Victors Scholarship would not be eligible for the Michigan Competitive Scholarship.

Please note: Some scholarships require full-time enrollment before disbursement.

Cost of Attendance

umdearborn.edu/students/financial-aid/what-um-dearborn-costs
(https://umdearborn.edu/students/financial-aid/what-um-dearborn-costs/)

Each year, the Office of Financial Aid & Scholarships (OFAS) provides an estimated cost of attending UM-Dearborn. The estimated cost includes tuition and fees as charged on your student account (estimated until Census Date), housing allowance (with or away from parents/family)
and other costs which can include transportation, books, supplies, and personal expenses. Your actual expenses may vary; periodic student surveys determine some of these personal costs and estimate a typical financial aid budget.

Tuition and fees are subject to change without notice by action of the Board of Regents. For current tuition and fees, individuals should consult umdearborn.edu/students/registration-records/tuition-fees (https://umdearborn.edu/students/registration-records/tuition-fees/).

How to Apply for Financial Aid

Most assistance is committed at a certain time of the year, so be mindful of application dates. Dates assume entrance for the fall semester.

Freshmen and Transfer Students

1. After October 1, preceding Fall enrollment, complete the Free Application for Federal Student Aid (FAFSA). Students must apply online at fafsa.gov (http://www.fafsa.gov). Include student and parent (if applicable) FSA IDs. Release the FAFSA information to the University of Michigan-Dearborn by entering our Federal Title IV School Code 002326. Students and parents should use their Federal Income Tax Returns (Form 1040) to complete the FAFSA. FAFSA results received in the Office of Financial Aid & Scholarships (OFAS) by the recommended priority deadline will receive first priority consideration for funds.

2. Upon review of your FAFSA, the Federal Processor will provide you with a Student Aid Report (SAR). The Federal Processor will forward an electronic SAR to the email address you provided on the FAFSA. The OFAS will receive your information electronically (assuming you have released the information to UM-Dearborn as described in #1 above).

Continuing Students

Students currently enrolled must apply every year at fafsa.gov (https://www.fafsa.gov) after October 1 preceding fall enrollment. Applications, SARs, and/or ISIRs (resulting from the FAFSA) must be received in the Office of Financial Aid & Scholarships by the recommended priority deadline to receive priority consideration for funds.

Summer

Summer is a separate processing period. Applications for Summer aid are available in late March/early April. Funding for the Summer term(s) is dependent upon funding levels after the two regular terms.

Reminders

1. Financial aid applications are processed only after a student has been admitted, but students need not wait until they are admitted to apply for financial aid.

2. Applications submitted after the stated dates will be considered, subject to the availability of funds, but notification may not come until after the term has begun.

3. Students must re-apply for financial aid each year.

4. All correspondence and documents must include the student’s legal name and UMID number.

Award Notification

New Students

Incoming students are notified in writing via U.S. mail of their initial financial aid offer. Thereafter, communication is via Email and UM-Dearborn Connect (see below).

Current/Returning Students

Students are encouraged to regularly check their UM-Dearborn Email account and access their UM-Dearborn Connect account for award notification and other communication from the Office of Financial Aid & Scholarships. Email communication sent to student’s UM-Dearborn Email address directs students to recent notices or activity on UM-Dearborn Connect.

Additive Credit

Additive credits courses do not count toward any degree requirements. For financial aid purposes, only additive credit courses that are academic and developmental/remedial in nature will be considered (COMP 099, MATH 080 & 090, CHEM 090 & 091). Additive credits include most co-op/internship courses, which will not count toward enrollment for financial aid eligibility.

Award Procedures

All financial aid awards are made in accordance with three criteria: demonstrated financial need, the student’s ability to maintain satisfactory academic progress and availability of funds. Completed files are processed on a first-come, first-served basis. A financial aid file is complete only after the following documents or information have been received:

- A completed FAFSA on file with the U.S. Department of Education. The processed FAFSA must be valid and have the University of Michigan-Dearborn school code (002326) listed so that OFAS can obtain the results electronically.

- The submission of all other information requested by the Office of Financial Aid & Scholarships (required prior to disbursement of federal aid), including verification documents if necessary.

Once a student’s financial aid file has been reviewed and deemed complete by a financial aid counselor, a financial aid package will be processed and an award notification will be mailed or Emailed to the student. The initial financial aid package will be based on assumed full-time status for the fall and winter semesters. Awards will be adjusted to actual enrollment. Financial aid awards can be viewed on UM-Dearborn Connect.

Repeating Coursework

Federal financial aid programs can only pay for one repeat of a passed course (passed meaning grade “D” or higher). For example, if a student enrolls and earns a grade of “D” in a course, the student’s enrollment status for financial aid will include that course attempt. If a student enrolls a second time in the same course, the course will be included in the student’s enrollment status for financial aid. If the student enrolls for a third time, financial aid will not include the course in the student’s eligibility for aid. When a course is repeated, the previous enrollment is deducted from the calculation of successfully completed courses; therefore, this will lower your Cumulative Completion Rate.

The University of Michigan-Dearborn may allow a successfully-completed course to be repeated beyond financial aid limitations. Only the last grade received is counted in the CGPA.
Types of Financial Aid

There are three basic categories of financial aid: gift aid (scholarships and grants), loans, and part-time employment. Most assistance is offered as a package of two or more kinds of aid. Undergraduates (in pursuit of the first bachelor's degree) who apply to the OFAS are considered for all three types of assistance. Undergraduates in pursuit of a second bachelor's degree are considered only for loans and work assistance.

Gift Aid

Scholarships and grants do not require repayment or work. Gift aid takes the following forms:

Freshman & Transfer Scholarships

The University offers a variety of scholarship resources for freshman and transfer students. These scholarships have specific selection criteria. Some of the funds require prior commitment and participation, most do not. For detailed information regarding criteria for these scholarships, please refer to the OFAS website (https://umdearborn.edu/students/financial-aid/types-aid/scholarships/) or contact the Office of Admissions at 313-593-5100.

Most scholarships have terms and conditions. These can be found by following the steps to accept your scholarship online at umdearborn.edu/students/financial-aid/accepting-receiving-aid/accepting-scholarships/.

Grants

Eligibility for the following Federal, State and University grant funds are determined according to demonstration of need (based on the outcome of the FAFSA), and availability of funds. The grants are considered for undergraduate students pursuing a first bachelor's degree. Unless otherwise stated, at minimum, eligibility requires adherence to Federal fund criteria, maintenance of the University’s Satisfactory Academic Progress guidelines, and enrollment of at least half-time (6 or more credit hours).

Federal Pell Grants

Pell Grant is a federal program with award currently ranging from approximately $657 to $6,195. An Expected Family Contribution (EFC) of 0 results in an award of $6,195 based on full-time enrollment for the academic year. The Federal Pell Grant Program is considered the foundation grant to which all other sources are added to create a financial aid package. Grant is one of the few programs that permit some students to receive a prorated portion of the award at a less-than-half-time enrollment status.

The Federal Pell Grant Program has lifetime eligibility limitations for all Pell Grant recipients. Pell Grant recipients are eligible to receive a maximum of 12 full-time semesters of this grant. Once students have used 12 full-time semesters, they are no longer eligible for any additional Federal Pell Grant. There is no appeal for this restriction.

Students are able to track their eligibility used on the National Student Loan Data System (https://nslds.ed.gov/nslds/nslds_SA/) (NSLDS). Access is gained using your Federal Student Aid ID (FSA ID).

The limitations of financial aid eligibility impact financial aid and scholarship programs. It is important to work closely with your academic advisor to stay on track to meet degree requirements to make the best use of financial aid funds.

Census Date - Each semester, the enrollment level is locked upon the Census Date for all students by the Office of Records and Registration. The Census Date is defined as the end of the Add/Drop period. At this point, the Pell Grant will disburse based on the number of credits in which a student is enrolled. If an additional course is added after the Census Date, the Pell Grant is not adjusted for the increase in credits. No exceptions are made and appeals will not be considered.

Federal Supplemental Educational Opportunity Grants (FSEOG)

FSEOG is a federal campus-based program used to supplement the Pell Grant of the neediest Pell Grant recipients. At UM-Dearborn, FSEOG is reserved for students with a 0 Expected Family Contribution (EFC).

TEACH Grant

(teacher education assistance for college and higher education)

Funded by the federal government, the TEACH Grant provides up to $3,764 per year for students whose intention is to teach in a “high need field” (subject area), in an elementary or secondary school serving students from low-income families. As a recipient, students agree (in advance of receipt) to teach a “high need field,” full-time, for a minimum of four years within the eight years following program completion (or progress interruption from the program for which the grant was awarded). The FAFSA is required to be considered for a TEACH Grant. However, recipients do not have to demonstrate “need.”

The TEACH Grant will remain a grant if recipients meet the specific criteria. If recipients do not meet the criteria, the TEACH Grant converts to an unsubsidized loan with interest calculated back to the initial disbursement date(s). For this reason, UM-Dearborn has defined our eligibility criteria as cautiously as possible.

The population UM-Dearborn currently considers for the TEACH Grant are Seniors (at the undergraduate level) and graduate level students, with a high Cumulative Grade Point Average (CGPA), admitted into a degree-granting program of the College of Education, Health, and Human Services, and pursuing majors that align with the “high need fields.”

The minimum CGPA requirement for the TEACH Grant is 3.25 (on a 4.0 scale). The degree programs currently considered are: Bachelor of Arts and Bachelor of Science. Eligible majors at UM-Dearborn are: Education, General Science, Mathematics, Mathematics Studies, Reading Science Education, Science Studies, Special Education, and Teaching.

Michigan Competitive Scholarship (MCS)

Funded by the State of Michigan, the Michigan Competitive Scholarships are available to many Michigan high school graduates from the Office of Student Scholarships and Grants, Michigan Department of Treasury. Scholarships are awarded to qualifying undergraduates attending public colleges and universities in Michigan. To qualify for the scholarship, students must demonstrate aptitude based on their performance on the ACT or SAT, as well as financial need as determined by uniformly applied methodology via information from the FAFSA. Recipients must also meet Michigan residency requirements.

Children of Veterans’ Tuition Grant Program

The Children of Veterans’ Tuition Grant Program offers Tuition Grant assistance to the children of Michigan veterans who were killed while in service, died as a result of service-related disabilities, or are considered
100% disabled because of service-connected disabilities. The child must be a Michigan resident between the ages of 16 and 25. Upon admission to a Michigan institution of higher learning, eligible undergraduates may qualify for a Tuition Grant of up to $2800 each academic year for full-time enrollment (amounts are prorated for less than full-time enrollment). Students must maintain a 2.25 or higher cumulative grade point average. Inquiries may be directed to the State of Michigan’s Office of Student Scholarships and Grants at 888-447-2687.

**University of Michigan-Dearborn Grant**

Funded by the University of Michigan-Dearborn, UM-Dearborn Grants are awarded to help high need students defray tuition costs. The Expected Family Contribution (EFC) is used to determine eligibility for these grants. Given eligibility and funding, students who apply by the priority deadline are automatically considered for the appropriate type of grant.

**Loans**

Eligibility for the following Federal loan programs are determined according to demonstration of need (based on the outcome of the FAFSA) and also individual, annual, and aggregate borrowing parameters. Eligibility requires adherence to Federal fund criteria, maintenance of the University’s Satisfactory Academic Progress guidelines, and minimum enrollment of at least half-time (6 or more credit hours). Requirements are subject to change over time. Additional documents may be required (e.g., Promissory Notes and Entrance Counseling) prior to disbursement of funds.

**William D. Ford Federal Direct Loan Program**

Federal Direct Loans are available through the William D. Ford Federal Direct Loan Program. Under the Federal Direct Loan Program, funds are lent to student or parent borrowers directly by the U.S. government. There are several types of Direct Loans: the Federal Direct Subsidized Loan (Subsidized FDSL), Federal Direct Unsubsidized Loan (Unsubsidized FDSL), Federal Direct Parent Loan for Undergraduate Students (FDPLUS), and the Federal Direct Consolidation Loan program.

**Subsidized vs. Unsubsidized Federal Direct Loan**

The Subsidized Federal Direct Loan is a need-based loan, while the Unsubsidized Federal Direct Loan is not. Students borrowing a Subsidized Loan are not assessed interest while they are enrolled at least half-time. Those borrowing an Unsubsidized Loan are assessed interest while enrolled in school, but payment of the interest is deferred until loan repayment begins. A student may pay interest while enrolled, which will result in lower loan payments over the life of the loan and a lower long-term cost.

Because Federal Direct Loan awards have origination fees, the Direct Loan amounts applied to your University student account will be lower than those listed on your Award Notice.

**Direct Subsidized Loan Time Limitation**

New Federal Direct Subsidized Loan borrowers are limited in the amount of time they qualify for an interest subsidy. Students who have exceeded 150 percent of the published length of their educational program will be:

- Ineligible for additional Federal Direct Subsidized Loans (though you may borrow a Federal Direct Unsubsidized Loan) and
- Responsible for interest on all loans accruing after exceeding the 150 percent limit.

New borrowers are defined as students with no outstanding federal loan principal balance when they take out a new loan after July 1, 2013. Transferring between programs does not reset loan eligibility. Interest not paid will be capitalized, effectively increasing your loan principal upon repayment.

**Undergraduate students approaching graduation:** If you are enrolled less than full-time during your final term, you may not be eligible for the full, annual maximum federal loan limit. Consult with an aid officer to discuss your situation.

### Annual and Lifetime Federal Direct Student Loan Limits

<table>
<thead>
<tr>
<th>Class Level</th>
<th>Dependent Undergraduate</th>
<th>Independent Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshmen (0—24 credits)</td>
<td>$5,500 (only subsidized loans)</td>
<td>$9,500 (only subsidized loans)</td>
<td></td>
</tr>
<tr>
<td>Sophomores (25—54 credits)</td>
<td>$6,500 (only subsidized loans)</td>
<td>$10,500 (only subsidized loans)</td>
<td></td>
</tr>
<tr>
<td>Juniors and Seniors (55 credits and above)</td>
<td>$7,500 (only subsidized loans)</td>
<td>$12,500 (only subsidized loans)</td>
<td></td>
</tr>
</tbody>
</table>

**Graduate (Masters or Doctoral)**

- $9,500 can be in unsubsidized loans
- $12,500 can be in unsubsidized loans
- Up to $20,500 in unsubsidized loan

**Maximum Total Debt From Direct Student Loans Upon Graduation**

- $31,000 (only in unsubsidized loans)
- $57,500 (only in unsubsidized loans)
- $138,500 (only in unsubsidized loans).

Graduate loan debt will also include Federal Direct Student Loans received as an undergraduate.

**Federal Direct Parent Loans for Undergraduate Students**

Direct PLUS Loans are part of the federal Direct Loan Program, which makes loans directly from the U.S. Dept. of Education.

The parent(s) of a dependent undergraduate must apply for PLUS loans separately if they need additional funds to cover costs. Eligibility is not based on need and borrowers may obtain up to the amount of Cost of Attendance minus any other financial assistance received.

The Direct PLUS Loan may be of interest to a parent whose student:

- is not eligible for other aid
- has unusual costs above standard student expense budgets
- has remaining financial need after other forms of aid are awarded or
- wishes to borrow all or part of their Expected Family Contribution.

There are certain requirements to qualify for the PLUS loan and the federal processor will access your credit report as part of the application process. Because credit checks are valid for a limited time, applications for the Fall and/or Winter terms should be completed beginning in early
Satisfactory Academic Progress

Federal Direct Consolidation Loan
Federal Direct Consolidation Loans are designed to help student and parent borrowers simplify loan repayment. This loan allows the borrower to consolidate several types of federal educational loans with various repayment schedules into one loan, requiring only one payment per month. Interest rates, however, may differ depending on the loan category as well as repayment and deferment options for the borrower.

Borrowers in default on a previous federal education loan may be able to obtain a Direct Consolidation Loan as a method of resuming the educational process and regaining eligibility for financial aid funds. (Those in default are ineligible for any and all financial aid while the default status is unresolved.)

Those interested may contact their Direct Loan Servicer or access their web site studentloans.gov (http://studentloans.gov) for additional information.

Student Employment
Federal Work-Study Program—Federal Work-Study is a Title IV program offering part-time work for students who demonstrate financial need. Students work up to 25 hours per week during the regular semester, depending upon the student’s financial need, availability of federal funds, and the student's class schedule. Seven percent of the school’s annual Federal Work-Study allocation will be used to fund community service jobs.

Work-Study awards are earned by working for Work-Study employers and earning a paycheck, typically paid bi-weekly through the employer’s payroll system. Work-Study earnings will not credit to your tuition and fee bill. Employers pay a percentage of students’ wages and federal funds pay the remaining wages.

University openings are posted on careers.umich.edu (http://careers.umich.edu/). You can also contact the Office of Career Services (https://umdearborn.edu/students/office-career-services/) for assistance with Off-Campus openings. You must show the employer a copy of your Award Notice and proof that your enrollment is at least half-time (6 or more credit hours) and inform your employer if your Work-Study eligibility changes.

On-campus Employment
On-campus employment is funded by UM-Dearborn, when not funded by Federal funds. There are many part-time and temporary jobs available in the academic departments and in the support offices. Eligibility for Federal financial aid funds is not a requirement for University employment. Students may contact the Office of Career Services (https://umdearborn.edu/students/office-career-services/) to inquire about job availability. The departments pay 100 percent of these wages. To locate an on-campus job, visit careers.umich.edu (http://careers.umich.edu/).

Other Sources of Financial Aid
Other sources of financial assistance are available through government agencies such as Vocational Rehabilitation, Veterans Administration, and Social Security. Students needing information on these programs should contact the nearest appropriate agency.

Assistance for educational expenses may also come in the form of tax allowances. The Internal Revenue Service publishes Publication 970. Publication 970 provides information on educational benefits allowed within the tax code. Publication 970 may be obtained from the Internal Revenue Service or viewed online at irs.gov/publications/p970 (http://www.irs.gov/publications/p970/).

Satisfactory Academic Progress

Satisfactory Academic Progress (SAP) describes a student’s successful completion of coursework toward a degree. SAP is monitored at the end of each semester (Fall, Winter, Summer). To maintain SAP, a student must:

• SAP is monitored at the end of each semester (Fall, Winter, Summer).
• Undergraduates must successfully complete a minimum percent of attempted courses.
• Undergraduates must achieve a required 2.0 cumulative grade point average or higher, if required by your academic unit.
• Students must complete academic program within 150% of published length of program. For transfer students: The number of transfer hours accepted at the point of admission are used to calculate a student’s remaining eligibility under the 150% standard and will be included in the quantitative calculation which includes number of credits attempted and completed.
• Graduate students must complete at a minimum rate of 67% of attempted courses.
• Graduate students must maintain 3.0 CGPA or higher if required by your academic unit.
• For second undergraduate degree students: These students are eligible to receive only loan funds within the program aggregate. Second-degree students are given 150% of stated credit hours required for the second degree program.

Satisfactory Academic Progress Standards

Students who receive financial aid must demonstrate SAP as determined by the University of Michigan-Dearborn in accordance with federal regulations. Financial aid recipients are required to be in good academic standing and to maintain SAP toward their degree requirements for each semester in which they are enrolled. SAP is required to maintain eligibility for financial aid. The requirements for financial aid may be different than those required by one's academic unit. The standards of Satisfactory Academic Progress measure a student’s academic progress using both qualitative and quantitative measurements. These measurements include a Cumulative Grade Point Average (CGPA) requirement, a Cumulative Completion Rate requirement, and a Maximum Timeframe requirement. In addition, certain types of courses are limited or excluded from eligibility.

The standards apply to all federal financial aid programs and programs funded and administered by the University of Michigan-Dearborn Office of Financial Aid and Scholarships and include degree, certificate, and consortium guest students who receive financial aid. SAP is evaluated at the end of each term (Fall, Winter, and Summer). Federal regulations require the University of Michigan-Dearborn to evaluate all students for SAP regardless of whether or not they receive financial aid. SAP is evaluated based on the student’s cumulative academic record, from the date of entry to the university.

Cumulative Grade Point Average (CGPA) The qualitative measurement assesses the student’s Cumulative Grade Point Average (CGPA).
• Undergraduate Students: The minimum CGPA requirement is a 2.00 or higher, if required by your academic unit.
• Graduate/Professional Students: The minimum CGPA requirement is a 3.00 or higher, if required by your academic unit.

Completion Rate The quantitative measure assesses the pace at which a student progresses towards a degree. To ensure progress, students are required to complete a minimum percentage of all attempted courses (please see below for details). Attempted courses are those for which a student is enrolled at the conclusion of the Add/Drop period for a semester (those that appear on the academic transcript).

Students who fulfill this minimum rate of course completion and follow departmental recommendations on course selection should complete their degree within the Maximum Timeframe.

<table>
<thead>
<tr>
<th>Attempted Credit Hours/Status</th>
<th>Required Completion %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 30 Hours</td>
<td>55%</td>
</tr>
<tr>
<td>31 – 60</td>
<td>62%</td>
</tr>
<tr>
<td>61 and above</td>
<td>67%</td>
</tr>
</tbody>
</table>

Maximum Timeframe (MTF) Federal regulations require that a student must complete his or her educational program within a Maximum Timeframe (MTF) no longer than 150% of the published length of the educational program measured in academic years, terms or credit hours attempted.

Up to 30 required remedial credits will be added onto the program length when determining compliance with the 150% of program length completion requirement.

Transfer Credits Courses that are transferred from another institution and accepted toward an academic degree program at the University (at the time of SAP review) count as attempted and completed hours for Completion Rate and Maximum Timeframe (MTF). The CGPA is determined only with courses taken in residence at the University.

Grades, enrollment/withdrawal and repeated classes

GRADES: Only courses for which a student receives a grade of A, B, C, D, or P are acceptable. A grade of E, UE, F, ED, W, NR, or X is not acceptable. Students who fail to complete at least 67% of attempted credit hours because of incomplete grades or who withdraw from all classes will be placed on probation for one semester. If they still fail to meet the 67% completion rate, their financial aid will be terminated. A student may receive financial assistance for a course that was repeated and for which a non-passing grade was received.

REPEATED CLASSES: Students who receive a passing grade may repeat that class once and have that enrollment considered for financial aid. (Repeating classes that do not result in additional hours earned will not improve completion rate.)

TERMS WITH FAILING GRADES: Office of Financial Aid and Scholarships will be verifying attendance during a term in which all grades received are unacceptable (as defined above). Failure to verify attendance in each class will result in cancellation of all aid for the term.

REGAINING AID ELIGIBILITY: A student may regain eligibility by notifying the UM-Dearborn Office of Financial Aid and Scholarships when these three things have been accomplished:

1. Complete a minimum of 12 credit hours for undergraduates or 8 credits for graduate students at UM-Dearborn (or as specified in the Academic Plan) without the benefit of financial aid. Students may take the credits at another institution of higher education if approved by their academic advisor; and,
2. Achieve a minimum GPA of 2.0 for undergraduates or 3.0 for graduate students; and,
3. Complete 100% of attempted credit hours.

NOTE: For more information regarding Satisfactory Academic Progress and how it effects your financial aid see the complete policy online at umdearborn.edu/students/financial-aid/consumer-information/standards-academic-progress/(https://umdearborn.edu/students/financial-aid/consumer-information/standards-academic-progress/).

Return of Title IV Funds

Students sometimes find it necessary to withdraw from all classes during a semester. Depending on when this occurs, students may receive a refund of all or part of tuition and fees. If the student is a financial aid recipient, the University and student may be required to return the aid, or a portion of it, to the federal government.

Tuition Refund Policy: The University has a tuition refund policy stipulating the amount of tuition and fees refunded to a student who withdraws from all classes during a term. The Registrar’s Office determines specific tuition refund dates each term (umdearborn.edu/students/registration-records/academic-calendar-important-dates/(https://umdearborn.edu/students/registration-records/academic-calendar-important-dates/) and select “Registration Deadlines” for the specific semester). Students must notify the Registrar’s Office immediately by following specific withdrawal procedures. Visit umdearborn.edu/students/registration-records/(https://umdearborn.edu/students/registration-records/) for hours of operation.

Unofficial withdrawals

The federal government considers an unofficial withdrawal one in which a failing grade is received when a student does not attend, or stops attending, a class for which he/she is enrolled. In these cases, students can be required to repay aid received. If you have questions about enrollment and aid eligibility, contact the Office of Financial Aid and Scholarships for assistance.

Allocating returned Title IV (federal) financial aid

Funds returned to the federal government reimburse the individual federal programs from which the student received the aid. Financial aid returned (by the university and/or the student or parent) must be allocated, in the following order, up to the net amount disbursed from each source:

1. Federal Unsubsidized Direct Loan
2. Federal Subsidized Direct Loan
3. Federal Perkins Loan
4. Federal Direct PLUS (Parent) Loan or Grad PLUS Loan
5. Federal Pell Grant
6. Federal Supplemental Educational Opportunity Grant (FSEOG)
7. Other Federal Loan or Grant Assistance

Return of Title IV (federal) financial aid

The Office of Financial Aid and Scholarships is notified by the Registrar when a student has officially withdrawn from the University. The federal government mandates that students withdrawing from all classes may keep only the financial aid they have “earned” up to the time of withdrawal.
Title IV funds disbursed in excess of the earned amount must be returned by the University and/or the student to the federal government. The student could owe the University, the government, or both.

The calculation for Return of Title IV funds is based upon the date on which a student initiates the withdrawal process by indicating intent to withdraw. This is either by speaking with an academic advisor, member of the Registrar's staff, or completing the University's withdrawal form.

Students who withdraw will have academic activity confirmed by their instructors to determine the last date of attendance. Failure to receive attendance or participation, from instructors, will result in cancellation of all aid for that semester.

To determine what a student earns, we:

- Divide the number of calendar days the student has attended classes by the total number of calendar days in the semester (minus any scheduled breaks of 5 days or more).
- The resulting percentage is multiplied by total federal funds disbursed (either to the student's University account or to the student directly by check or direct deposit) for the semester.
- This calculation determines the amount of aid earned that a student may keep. (For example, if the student attended 25% of the term, he will have earned 25% of the aid disbursed. The unearned amount must be returned to the federal government by the University and/or the student.)

We will notify students who are required to return funds to the government. In some instances, students who withdraw may be eligible for a post-withdrawal disbursement of "earned" aid. The following conditions must be met for the student to be considered eligible:

- The student must have submitted a valid FAFSA to UM-Dearborn prior to date of withdrawal.
- UM-Dearborn must have made an offer of federal aid to the student. In the case of a Direct Loan, the University must have originated the loan with the U.S. Department of Education, must have documentation that the student signed a loan promissory note, and must be making the first disbursement of the loan.

Students considering withdrawal from all classes should contact the Office of Financial Aid and Scholarships and their academic advisor so that the consequences of withdrawing from all classes can be explained. Financial aid counselors can further explain this policy to students and parents.

Student Consumer Rights and Responsibilities

Section 493.A of the Higher Education Act requires post-secondary educational institutions to disseminate relevant, candid information on student financial aid programs available at the college. Any change in a student's financial situation, address, or school enrollment must be reported to the Office of Financial Aid & Scholarships. Students have the right to request a review of their financial aid package when a change in family or personal circumstances occurs. Students also have a right to review their financial aid records and may do so during counseling hours.

Information Dissemination and Report Disclosure

The U.S. Department of Education requires UM-Dearborn to disseminate information and disclose certain information to students. This information includes, but is not limited to: Voter Registration, Equity in Athletics, Campus Crime and Security, Completion and Transfer-Out Rates, and Drug and Alcohol-Free Campus policies. For further information on the listed topics, please refer to the University website at umdearborn.edu/students/financial-aid/consumer-information/.

Registration & Records

Office of the Registrar
4901 Evergreen Road
1169 University Center
Dearborn, MI 48128
313-583-6500
313-593-4896 [FAX]
registrars@umich.edu
umdearborn.edu/registration (http://umdearborn.edu/registration/)

The mission of the University of Michigan-Dearborn Office of the Registrar is to provide accurate academic record information and policy services to faculty, staff, students, alumni, the administration and external constituencies. The Office of the Registrar collects and disseminates student, course, and instructional information through processes that ensure the integrity and security of all academic records particularly with regard to the Family Educational Rights and Privacy Act (FERPA) as set forth by the Federal Government.

The Office of Registrar is responsible for all aspects of student registration and academic records. The office's primary functions include schedule preparation, registration, grade processing and custodianship of student records. In addition, we are charged with the responsibility of communicating and administering academic policies, which we endeavor to enforce consistently and fairly. These activities are integral to the educational activities of the University, thereby supporting the primary mission, aspirations, and goals of the University of Michigan-Dearborn.

Auditing

Students are expected to elect courses for credit. The student's program advisor, however, with the concurrence of the instructor involved, may grant official auditing privileges when they are warranted for educational reasons. A student auditing a course is charged the usual fee for that course. Any specific conditions must be enunciated by the instructor at the time permission is granted for the audit.

Change of Fees and Refunds

When appropriate, a change of fees will be processed by the Office of the Registrar when a student submits an "Add/Drop/Registration Form" or "Withdrawal Form" which affects the fee previously assessed. Individuals are also advised to see "Change in Course Elections" in this Catalog.

Refunds of tuition, fees, or student account credit balances are generated automatically. After authentication and processing, the refund is issued to the student.

Adding

A student who increases the number of hours elected will have a new fee assessment generated by the Office of the Registrar indicating the appropriate fees to be paid.
Dropping (for Full, Half, and Four-Week Mini Courses)

A student who, during the first two weeks of a full term or the first week of a half term or mini-term reduces the number of hours elected, will have a new fee assessment generated by the Office of the Registrar indicating the appropriate fees to be paid. No reduction in fee assessments will be made after the end of the second week of classes (first week of a half-term) except in cases of withdrawal from the University.

Dropping (for less than One-Month Mini Courses)

A student may drop from a less than one-month mini-course on or before the first class meeting of such a course without financial penalty. Thereafter, full tuition will be assessed and the academic record will reflect the symbol for withdrawal ("W").

Withdrawing (for Full, Half, and Four-Week Mini Courses)

A student who withdraws from UM-Dearborn is assessed as follows:

1. Students who withdraw prior to the first day of classes will not be charged any tuition assessments or fees.
2. Students who withdraw during the first week of a half term or mini-term, or during the first two weeks of a full term, will not be charged any tuition assessments or fees.
3. Students who withdraw during the second through third week in a half term or mini-term, or in the third through sixth week of a full term, will be charged 50% of the tuition assessed, as well as the non-refundable registration assessment. In addition, there is no reduction in lab/course fees.
4. Students withdrawing after the time periods indicated in Paragraph "3" will be assessed full tuition and fees.

Withdrawing (For Less Than One-Month Mini Courses)

1. Students who withdraw from a less than one-month mini course before the first class meeting of such a course will not be charged any tuition assessments or fees.
2. Students who withdraw from a less than one-month mini course on the first day of class will not be charged any tuition assessments or fees.
3. Students who withdraw from a less than one-month mini course on the second day of class will be assessed 50% of the tuition assessed, as well as the non-refundable registration assessment. In addition, there will be no reduction in lab/course fees.
4. After the second class meeting of such a course, the student shall pay all fees and assessments.

Change in Course Elections: Add, Drop, Withdrawal

(See Also “Change of Fees And Refunds”)

Changes in course elections include adding a course(s), dropping a course(s), substituting course(s), and withdrawing (discontinuing) all courses. All students will process their add/drop and withdrawals online or at the Office of the Registrar’s (1169 UC, with signatures when appropriate).

Please consult the section on “Change of Fees and Refunds” for the impact on tuition and fees.

Add

A student may add courses or change a standard graded course to Pass/Fail or Audit during the first two weeks of a full term, the first week of a half term or mini-term, or before the second class meeting of a less than one-month mini-term. Any exceptions for adding courses must be approved by the student’s academic unit.

Drop

A student may drop a course(s) during the first two weeks of a full term, the first week of a half term or mini-term, or before the second class meeting of a less than one-month mini-term. No record of the student’s brief enrollment will be recorded.

Courses may be dropped during the third through the ninth week of classes in a full term, during the second through the fourth week of classes in a half term or mini-term, and before the third class meeting in a less than one-month mini-term.

The effective date of the drop is the date the drop form is received and signed at the Office of the Registrar’s counter.

Permission to drop courses under circumstances other than stated above will require the approval of the student’s academic unit.

Withdrawal

A student may discontinue all of his/her courses through the last day of classes (for the term) by withdrawing from the term. The completed form must be presented to the Office of the Registrar’s Counter for processing. The effective date of the withdrawal is the date the withdrawal form is received and signed at the Office of the Registrar’s Counter.

If a student withdraws (drops all courses) from a term during the first two weeks of classes in a full term, the first week of classes in a half term or mini-term, or before the second class meeting in a less than one-month mini-term, no record of the student’s brief enrollment will be recorded. Beyond those deadlines, the mark of W will appear on the transcript.

Permission to withdraw under circumstances other than stated above will require the approval of the student’s academic unit.

Consecutive Withdrawals

Every student’s academic record is reviewed for the purpose of observing academic progress at the end of each term in which the student is enrolled. A student who has not enrolled for one calendar year or who has withdrawn for two consecutive terms must apply for readmission and may not re-register without the explicit written permission of the student’s unit office. (PDS/PE students see Academic Support and Outreach Services, 2136 UC.)

A student who first registers and then withdraws from two consecutive terms may be placed on academic probation and may not register without the explicit written permission of the Associate Dean or the Associate Dean’s representative.
Required Withdrawals

Unless extenuating circumstances are presented by petition, a student who is required to withdraw from one academic unit may not be admitted to another UM-Dearborn academic unit within the same term as that in which such withdrawal action is taken.

Refunds and Financial Aid

Students receiving Title IV financial aid may be required to repay some or all of the financial aid received for a term in which the student withdraws. Students required to repay financial aid funds will have the refunds allocated to financial aid programs in the following order: Federal Direct Loans, Federal Perkins Loans, Pell, SEOG, other Title IV, federal, state, private, and institutional programs and finally, to the student. Students receiving financial aid and considering withdrawal should seek the advice of a Financial Aid Officer prior to taking such action.

Class Standing

Class standing is determined by the total credits earned that apply toward the student’s degree program. The various classifications are as follows (numbers indicate semester hours):

- Freshman (0-24)
- Sophomore (25-54)
- Junior (55-84)
- Senior (85+)

Grades and Grading

- Grading System (p. 254)
- Grade Notations (p. 258)
- Change of Grade (p. 258)
- Grading Benchmarks (p. 259)

Grading System

Grade point averages (scholastic averages) are computed by dividing the honor points a student has earned by the hours elected. The term grade point average and the cumulative grade point average are computed for each student at the end of each term and become part of the student’s official UM-Dearborn academic record.

Symbols used in the grade reporting system common to all units are: F, failed (pass/fail option election); I, incomplete; NR, grade not reported; P, passed (pass/fail option election); S, satisfactory (courses graded S/E or S/U); NC, no credit; VI, audit; W, drop/withdrawal; X, absent from final examination; U, unsatisfactory (courses graded S/U only); Y, indicates the course extends beyond the term.

The grades of E, IE, UE or XE are not assigned honor points and thus will lower the student’s grade point average. The grade NC is used only for certain courses. When this grade is officially granted, the grade NC and the course will appear on the student’s transcript, but the course will not be used in computing a grade point average.

The recording of grades on a student’s official academic record is governed by the following (4.0) grading system:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Honor Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A,A+</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Note: The A+ and D- grades are not used by Engineering instructors. The A+ grade is not used by Education instructors.

Grades associated with transfer credit from other schools or colleges (including other University of Michigan campuses) are neither recorded nor used in computing grade point averages of students.

Students may repeat a course no more than two times. All grades received must appear on the transcript, but only the last grade received is counted in the grade point average (GPA). Please see the appropriate Graduate Repeat Course Policy (http://catalog.umd.umich.edu/archives/2019-2020/academic-policies-graduate/exempting-waiving-repeating-courses/) or Undergraduate Repeat Course Policy (see below) for more information.

Grades of D- in the College of Engineering & Computer Science

A grade of D- is not considered passing in any CECS course. If a CECS student earns a D- in a course from another academic unit it will not count toward a CECS degree or certificate and must be repeated.

Audit, Pass/Fail, and Non-Credit Courses in the College of Engineering & Computer Science

CECS students cannot take required courses within their major on an audit or pass/fail basis. Any course audited or taken pass/fail will not count towards the degree, even as a general elective. In addition, CECS students cannot use non-credit courses towards their degree.

Pass/Fail

Up to four courses taken with the pass/fail option — excluding courses counting towards the major(s), cognates, or minor(s) — by students will be accepted for credit towards a degree.

Grading Benchmarks

The University of Michigan-Dearborn seeks to provide greater clarification as to the characteristics for each grade level. The descriptions below provide general achievement targets for each grade level.

The grading benchmarks do not establish a campus-wide mandate for faculty grading or grading outcomes. Instructors at the University of Michigan-Dearborn have the autonomy to formulate their own grading standards and system. Students should discuss and confirm with their instructor the grading system and requirements employed within their course(s).

<table>
<thead>
<tr>
<th>Benchmarks</th>
<th>Grade</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior Achievement</td>
<td>A/A+</td>
<td>4.0</td>
</tr>
<tr>
<td>Outstanding</td>
<td>A/A+</td>
<td>4.0</td>
</tr>
<tr>
<td>Excellent</td>
<td>A-</td>
<td>4.0</td>
</tr>
</tbody>
</table>
Grading Benchmark Achievement Levels

Superior Achievement (A level)
The grade of A recognizes exceptional performance and achievement that exceeds course expectations and consistently demonstrates, where applicable, many of the following characteristics:

- Thorough, deep, and mature understanding.
- Genuine comprehension, insight, and synthesis.
- Significant mastery of challenging topics and issues.
- Extensive familiarity with relevant literature and previous work.
- Highly developed communication skills.
- Thorough preparation and extensive, thoughtful class participation.
- Integration of knowledge, concepts, and principles across disciplines.
- Originality of analysis and interpretation.
- Technical competence in skills and procedures.
- Precision of ideas and clarity of expression.
- Thinking that is independent, creative, and focused.
- Understanding of nuance and subtlety.
- Consistent coherence in argument and discussion.

Students who receive the grade of A consistently demonstrate, where applicable, the ability to:

- Analyze arguments using specific examples and original sources.
- Think logically, draw inferences, and make predictions in complicated situations.
- Communicate reasoning clearly and concisely.
- Think abstractly.
- Identify strengths and weaknesses in arguments, policies, and practices.

- Integrate information to draw well-founded conclusions.
- Connect course content to issues of other courses and world affairs.
- Use models appropriately, recognize their strengths and accommodate their inherent limitations.
- Foresee and evaluate consequences of proposed policies and actions.
- Use technology creatively and effectively.

Good Achievement (B level)
The grade of B recognizes work that meets course expectations and typically demonstrates, where applicable, many of the following characteristics:

- Clear understanding without much originality.
- Competent grasp of course materials and subject matter.
- Familiarity with relevant literature.
- Competence in communication skills.
- Regular preparation for and participation in class.
- Integration of course knowledge, concepts and procedures.
- Some evidence of critical and creative thought.
- Clear connections between inferences and evidence.
- Care in the use of evidence and quotations with only occasional thinness in argument, detail, or precision.

Students who receive the grade of B typically demonstrate, where applicable, the ability to:

- Extend ideas by connecting with personal experiences, reading, or world events.
- Analyze data in various forms and from varied sources.
- Utilize information to explain events, draw conclusions, and apply results.
- Present comprehensive answers in a clear and logically correct style.
- Understand and compare various models.
- Distinguish inputs from outputs, and causes from effects.
- Recognize consequences of complex interactions.
- Use technology effectively.

Adequate Achievement (C level)
The grade of C recognizes work that is sufficient to prepare for continued study in the field and generally demonstrates, where applicable, some of the following characteristics:

- Adequate grasp of course concepts.
- Partial mastery of knowledge and skills required for understanding.
- Incomplete familiarity with relevant readings or references.
• Writing that lists facts rather than develops well-reasoned arguments.
• Frequent neglect of important information.
• Partial appreciation of the meaning or implications of a questions.
• Answers that are insufficiently developed.
• Minimally complete assignments with many areas for improvement.

Students who receive the grade of C generally demonstrate, where applicable, some ability to:
• Assimilate and communicate simple knowledge and procedures.
• Extend ideas by making simple inferences.
• Make connections among and draw conclusions from course concepts.
• Interpret simple information provided in various formats.
• Organize and display data in tables and graphs.
• Use technology competently.

Limited Achievement (D level)
The grade of D indicates a lack of readiness to continue in the field. Students’ work usually demonstrates, where applicable, some of the following characteristics:
• Minimal understanding of the subject matter.
• Poorly developed communication skills.
• Inability to apply subject matter understanding in other contexts.
• Little evidence of critical or creative thinking.
• Lack of apparent seriousness.
• Frequent carelessness in fulfilling assignments.

Inadequate Achievement (E)
The grade of E indicates that course work is insufficient to merit academic credit. Students who receive an E usually demonstrate some of the following characteristics:
• Inadequate understanding of subject matter.
• Inadequate or inconsistent preparation.
• Frequent failure to complete assignments in a timely manner.
• Little evidence of critical thought.
• Very poor communication skills.
• Frequent misunderstanding of facts or references.
• Little or no analysis.
• Confused or incomprehensible writing.

Little or no work offering evidence that course objectives have been met.

Grade Notations
The following notations may appear on a transcript to describe special situations in regard to a course.

NC No Credit. No honor points. Not computed in the grade point average. Used only in specially approved courses that are graded A, B, C, No Credit.

I Incomplete. No honor points. A student whose coursework for the term (other than final examination) is incomplete in a minor way may, upon completion and approval of the I Contract Form, be granted the privilege of completing the work within a five-week period for the College of Engineering and Computer Science or the College of Business, and a four-month period for the College of Arts, Sciences, and Letters and College of Education, Health, and Human Services beginning on the first day of classes of the immediately following term. If granted this privilege, a grade of I will be recorded. Failure to complete the required work within the specified time, or the denial of this privilege by the instructor, may result in a grade of E for the final grade. In extenuating circumstances an extension beyond the stated period may be requested by means of a petition that has been endorsed by the instructor and approved by the Academic Standards Committee. However, such arrangements for completing the work must be made within the above stipulated time period. Failure to complete the required work within the specified time may result in a grade of I being automatically treated as an IE and counted in the student's grade point average. The I will remain on the transcript even after the official final grade is assigned.

X Absent from Final Examination. No honor points. A student who is unavoidably absent from a final examination may be granted the privilege of making up the examination within five weeks beginning from the first day of classes of the immediately following term. If granted this privilege, a mark of X will be recorded. Failure to take the examination within the specified time, or the denial of this privilege by the instructor, will result in a mark of X for the final grade. In extenuating circumstances an extension beyond the stated period may be requested by means of a petition that has been endorsed by the instructor. However, such arrangements for completing the work must be made within the above five-week period. The grade of X will automatically be converted to XE and reflected in the student's grade point average as a failing grade if the Supplementary Grade Report is not submitted by the end of the five-week period.

Y Course extended beyond term end. No credit. No honor points. A mark of Y indicates that a course extends beyond the end of one term. This mark is only used for courses that have been specially designed and approved to extend beyond the end of one term. A course with a Y mark may not be completed after graduation. If such a course is not completed, the Y will be converted to an E upon graduation.

NR Grade Not Reported. No honor points. Student should consult the Registrar immediately.

W Official Withdrawal. No credit. No honor points. Not computed in the grade point average. Students who drop a course or withdraw from all courses for a term before the deadline for official drops and/or withdrawals will receive for these courses the W notation. This notation may not be removed from the transcript.

S/E. Used only for specially approved courses. If a student passes, an S (satisfactory) is awarded. It is not computed into the grade point average. If a student does not pass, an E is awarded. If a student stops attending, without officially dropping, a UE is awarded. Both the E and the UE are
computed in the GPA as failing grades. (Exception: Failing grades in additive credit courses that are graded S/E have no impact on the GPA.)

P/F Pass/Fail Option. No honor points. A student must elect to take a course under the Pass/Fail option.

UE Unearned Fail. This grade is assigned to any student who has never attended, or stopped attending class during the semester and did not officially drop. It is computed in the GPA the same as an E.

VI Visitor-Official Audit. No credit. No honor points. Not computed into the grade point average. An official audit, or visitor status, allows a student to attend a course but not elect it for credit. The VI notation appears on the transcript. Regular tuition fees are assessed.

Change of Grades

The grade that an instructor records on the final grade sheet and that appears on the student's subsequent transcript is assumed to be final; that is, the instructor's official evaluation of all of a student's performance and work completed by the official end of the term (the last day of the final examination week).

The University permits a change of grade under the following circumstances:

• Recognizing that mistakes can be made, the University of Michigan-Dearborn permits a student to ask an instructor for a review of a grade within a five week period after the end of the term involved. After the expiration of this deadline, a student may initiate a request for a review only through the petition process involving the student's college Academic Standards Committee (or comparable group), whose decision shall be final. Such a review is entirely separate and distinct from the circumstances involving an X (Absent from Final Examination), I (Incomplete Coursework), or a Y (Course Extends Beyond Term).

• A student (or instructor) may initiate a grade change if the student discovers that a grade has been entered in error due to, but not exclusive to, the following:

  • possible omission by the instructor when computing the final grade, or material submitted by the student before the end of the term;
  • possible error in evaluation by the instructor of work submitted or final examination taken by the student before the end of the term;
  • possible error by the instructor in the computation of the final grade;
  • possible error in the recording of the grade by the instructor or staff; or
  • allegation of bias or prejudice on the part of the instructor in the assignment of the final grade. (This rare charge is to be handled according to the procedures established within the academic unit.)

Grade and Academic Grievances

All colleges follow the following process when handling student complaints related to grades:

1. The initial complaint regarding a course grade or assignment within a course shall be directed to the instructor
2. If the instructor determines that no change of grade should occur, the student may request the department chair to mediate a resolution
3. If the issue cannot be resolved at the department level, the student may petition the dean's office requesting a hearing on the matter

Specific policies may differ between colleges and departments. Please see the following for each college:

• The College of Arts, Sciences, and Letters has adopted its own college-wide and department-level grade appeal and change policies (https://umdearborn.edu/casl/undergraduate-programs/advising-student-records/policies-and-procedures/grade-appeal-policies/). Each department in the college has its own procedure for resolving grade complaints.

• The College of Engineering & Computer Science uses an Academic Grievance Policy (https://umich.app.box.com/s/ds21nulp04hymm8855gg9anu7n3f92/) to manage student complaints related to grade disputes.

• The College of Business has a Grade Change and Grade Grievance Policy and Procedures (https://drive.google.com/file/d/0BxdK3tGsYupSYTfj1NGI1bnFyY2M/view?usp=sharing).

• The College of Education, Health, and Human Services uses their Grade Change and Grade Grievance policy (https://umich.app.box.com/s/6ol812gmhidksi8t9afo79ay0fpzlvph/) for resolving grade complaints.

Repeating a Course (Undergraduate)

Students may repeat a course no more than two times. All grades received must appear on the transcript, but only the last grade received is counted in the grade point average (GPA).

Guidelines:

When a prior grade or mark other than "W" is recorded for a course a subsequent enrollment ("repeat") of the course, or its equivalent, or its cross-listing, will result in an adjustment of the grade point average and credits earned.

1. Students may repeat a course up to two times (total of three attempts).
2. Regardless of whether it is higher or lower than the previous grade(s), the last grade assigned in a course will be used in computing the student’s cumulative grade point average and credits earned toward degree.
3. If a student takes a course three times (the maximum allowed), the previous two grades will not be reflected in the GPA.
4. Most courses can be elected only once for credit. The maximum number of credits/elections allowed in courses designed for multiple enrollments are indicated in the Undergraduate Announcement. For
information regarding these courses, students may contact their Unit Academic Advisor.

This policy applies to all undergraduate degree and non-degree students in all academic units.

The policy applies only to courses elected Fall 2005 or later. Students who have repeated a course two or more times prior to Fall 2005 may repeat the course only one additional time. Only the two most recent previous grades will be affected by the new policy. Other previous grades will continue to be used in computing the grade point average.

Courses taken at institutions other than UM-Dearborn do not affect the grade point average.

The use of an Audit Grade Mode or Pass/Fail Grade Mode may not be used to adjust grade point averages for courses previously elected under any other existing grade mode.

For students who earned an undergraduate degree at UM-Dearborn and are now in the process of earning a second undergraduate degree at UM-Dearborn, the following rule will apply: If repeating a course in the second degree that was failed (with a grade of E) in the first degree, both course will be included in the GPA calculation and the course earned hours (assuming the course was passed) will be included in the earned hours of the second degree.

The limitation of the three-course rule will be monitored by the Office of Registration. Students who elect a course more than three times will be dropped from the course and notified of the election change.

## Grade Notations

The following notations may appear on a transcript to describe special situations in regard to a course.

**NC No Credit.** No honor points. Not computed in the grade point average. Used only in specially approved courses that are graded A, B, C, No Credit.

**I Incomplete.** No honor points. A student whose coursework for the term (other than final examination) is incomplete in a minor way may, upon completion and approval of the I Contract Form, be granted the privilege of completing the work within a five-week period for the College of Engineering and Computer Science or the College of Business, and a four-month period for the College of Arts, Sciences, and Letters and College of Education, Health, and Human Services beginning on the first day of classes of the immediately following term. If granted this privilege, a grade of I will be recorded. Failure to complete the required work within the specified time, or the denial of this privilege by the instructor, will result in a mark of E for the final grade. In extenuating circumstances an extension beyond the stated period may be requested by means of a petition that has been endorsed by the instructor. However, such arrangements for completing the work must be made within the above five-week period. The grade of X will automatically be converted to XE and reflected in the student’s grade point average as a failing grade if the Supplementary Grade Report is not submitted by the end of the five-week period.

**Y Course extended beyond term end.** No credit. No honor points. A mark of Y indicates that a course extends beyond the end of one term. This mark is only used for courses that have been specially designed and approved to extend beyond the end of one term. A course with a Y mark may not be completed after graduation. If such a course is not completed, the Y will be converted to an E upon graduation.

**NR Grade Not Reported.** No honor points. Student should consult the Registrar immediately.

**W Official Withdrawal.** No credit. No honor points. Not computed in the grade point average. Students who drop a course or withdraw from all courses for a term before the deadline for official drops and/or withdrawals will receive for these courses the W notation. This notation may not be removed from the transcript.

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**P/F Pass/Fail Option.** No honor points. A student must elect to take a course under the Pass/Fail option. Please check with your college for its policy on electing courses as pass/fail.

**UE Unearned Fail.** This grade is assigned to any student who has never attended, or stopped attending class during the semester and did not officially drop. It is computed in the GPA the same as an E.

**VI Visitor-Official Audit.** No credit. No honor points. Not computed into the grade point average. An official audit, or visitor status, allows a student to attend a course but not elect it for credit. The VI notation appears on the transcript. Regular tuition fees are assessed.

## Change of Grades

The grade that an instructor records on the final grade sheet and that appears on the student's subsequent transcript is assumed to be final; that is, the instructor's official evaluation of all of a student's performance and work completed by the official end of the term (the last day of the final examination week).

The University permits a change of grade under the following circumstances:

1. Recognizing that mistakes can be made, the University of Michigan-Dearborn permits a student to ask an instructor for a review of a grade within a five week period after the end of the term involved. After the expiration of this deadline, a student may initiate a request for a review only through the petition process involving the student's college Academic Standards Committee (or comparable group), whose decision shall be final. Such a review is entirely separate and
distinct from the circumstances involving an X (Absent from Final Examination), I (Incomplete Coursework), or a Y (Course Extends Beyond Term).

2. A student (or instructor) may initiate a grade change if he/she discovers that a grade has been entered in error due to, but not exclusive to, the following:
   - possible omission by the instructor when computing the final grade, or material submitted by the student before the end of the term;
   - possible error in evaluation by the instructor of work submitted or final examination taken by the student before the end of the term;
   - possible error by the instructor in the computation of the final grade;
   - possible error in the recording of the grade by the instructor or staff; or
   - allegation of bias or prejudice on the part of the instructor in the assignment of the final grade (This rare charge is to be handled according to the procedures established within the academic unit.)

Grading Benchmarks

The University of Michigan-Dearborn seeks to provide greater clarification as to the characteristics for each grade level. The descriptions below provide general achievement targets for each grade level.

The grading benchmarks do not establish a campus-wide mandate for faculty grading or grading outcomes. Instructors at the University of Michigan-Dearborn have the autonomy to formulate their own grading standards and system. Students should discuss and confirm with their instructor the grading system and requirements employed within their course(s).

The University of Michigan-Dearborn 2019-2020

Grading Benchmark Achievement Levels

<table>
<thead>
<tr>
<th>Benchmarks</th>
<th>Grade</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Superior Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outstanding</td>
<td>A/A+</td>
<td>4.0</td>
</tr>
<tr>
<td>Excellent</td>
<td>A-</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Good Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Good</td>
<td>B+</td>
<td>3.4</td>
</tr>
<tr>
<td>Good</td>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>Generally Good</td>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td><strong>Adequate Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfactory</td>
<td>C+</td>
<td>2.4</td>
</tr>
<tr>
<td>Sufficient</td>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>Marginal</td>
<td>C-</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Limited Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>D+</td>
<td>1.4</td>
</tr>
<tr>
<td>Very Poor</td>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>Extremely Poor</td>
<td>D-</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Inadequate Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>E</td>
<td>0.0</td>
</tr>
</tbody>
</table>

1 The University of Michigan-Dearborn has adopted the "Grade and Marking System" employed by St. Olaf College: catalog.stolaf.edu/academic-regulations-procedures/grades/

Superior Achievement (A level)

The grade of A recognizes exceptional performance and achievement that exceeds course expectations and consistently demonstrates, where applicable, many of the following characteristics:

- Thorough, deep, and mature understanding.
- Genuine comprehension, insight, and synthesis.
- Significant mastery of challenging topics and issues.
- Extensive familiarity with relevant literature and previous work.
- Highly developed communication skills.
- Thorough preparation and extensive, thoughtful class participation.
- Integration of knowledge, concepts, and principles across disciplines.
- Originality of analysis and interpretation.
- Technical competence in skills and procedures.
- Precision of ideas and clarity of expression.
- Thinking that is independent, creative, and focused.
- Understanding of nuance and subtlety.
- Consistent coherence in argument and discussion.

Students who receive the grade of A consistently demonstrate, where applicable, the ability to:

- Analyze arguments using specific examples and original sources.
- Think logically, draw inferences, and make predictions in complicated situations.
- Communicate reasoning clearly and concisely.
- Think abstractly.
- Identify strengths and weaknesses in arguments, policies, and practices.
- Integrate information to draw well-founded conclusions.
- Connect course content to issues of other courses and world affairs.
- Use models appropriately; recognize their strengths and accommodate their inherent limitations.
- Foresee and evaluate consequences of proposed policies and actions.
- Use technology creatively and effectively.

Good Achievement (B level)

The grade of B recognizes work that meets course expectations and typically demonstrates, where applicable, many of the following characteristics:

- Clear understanding without much originality.
- Competent grasp of course materials and subject matter.
- Familiarity with relevant literature.
- Competence in communication skills.
- Regular preparation for and participation in class.
- Integration of course knowledge, concepts and procedures.
- Some evidence of critical and creative thought.
- Clear connections between inferences and evidence.
- Care in the use of evidence and quotations with only occasional thinness in argument, detail, or precision.

Students who receive the grade of B typically demonstrate, where applicable, the ability to:

- Extend ideas by connecting with personal experiences, reading, or world events.
• Analyze data in various forms and from varied sources.
• Utilize information to explain events, draw conclusions, and apply results.
• Present comprehensive answers in a clear and logically correct style.
• Understand and compare various models.
• Distinguish inputs from outputs, and causes from effects.
• Recognize consequences of complex interactions.
• Use technology effectively.

Adequate Achievement (C level)
The grade of C recognizes work that is sufficient to prepare for continued study in the field and generally demonstrates, where applicable, some of the following characteristics:

• Adequate grasp of course concepts.
• Partial mastery of knowledge and skills required for understanding.
• Incomplete familiarity with relevant readings or references.
• Writing that lists facts rather than develops well-reasoned arguments.
• Frequent neglect of important information.
• Partial appreciation of the meaning or implications of a questions.
• Answers that are insufficiently developed.
• Minimally complete assignments with many areas for improvement.

Students who receive the grade of C generally demonstrate, where applicable, some ability to:

• Assimilate and communicate simple knowledge and procedures.
• Extend ideas by making simple inferences.
• Make connections among and draw conclusions from course concepts.
• Interpret simple information provided in various formats.
• Organize and display data in tables and graphs.
• Use technology competently.

Limited Achievement (D level)
The grade of D indicates a lack of readiness to continue in the field. Students’ work usually demonstrates, where applicable, some of the following characteristics:

• Minimal understanding of the subject matter.
• Poorly developed communication skills.
• Inability to apply subject matter understanding in other contexts.
• Little evidence of critical or creative thinking.
• Lack of apparent seriousness.
• Frequent carelessness in fulfilling assignments.

Inadequate Achievement (E)
The grade of E indicates that course work is insufficient to merit academic credit. Students who receive an E usually demonstrate some of the following characteristics:

• Inadequate understanding of subject matter.
• Inadequate or inconsistent preparation.
• Frequent failure to complete assignments in a timely manner.
• Little evidence of critical thought.
• Very poor communication skills.
• Frequent misunderstanding of facts or references.
• Little or no analysis.
• Confused or incomprehensible writing.

Little or no work offering evidence that course objectives have been met.

Graduation/Application for Diploma
Each candidate for a degree must file a Degree/Diploma Application with the Office of the Registrar, typically within ten days of the beginning date of classes for the term in which the student expects to complete the requirements for degree. Please consult the Applying to Graduate Webpage, umdearborn.edu/rr_apply-graduate (http://www.umdearborn.edu/rr_apply-graduate/), for specific dates. In extenuating circumstances, applications may be accepted after the published deadline. Applications accepted after the deadline will require a $35.00 non-refundable late application fee (cash or check only). Payment is due at the time of submission. Applications will not be accepted after the published deadlines. If an application for a diploma was filed for a previous graduation period in which the student did not graduate, a new application is necessary. Degrees are granted at the end of the fall, winter, and summer terms, even though commencement exercises are held only in April (or May) and December.

Instructor Requested Drop
A student who is absent from class meetings of a course during the first week of any term and does not inform the instructor or the instructor’s department of his/her intention to continue as a class member may receive a request, by the instructor, to drop the course. The student is responsible for processing all paperwork to officially drop this or any course. Please consult the Registration & Records web site for procedures on how to drop courses.

Registration Information
Academic Advising
Academic advising should be sought from the student's school, college or graduate department office prior to registration.

Appointment Time to Register
Continuing students who are eligible to register via the Web can determine their registration date based on credits earned as listed in the registration timetable. New students and those participating in non-traditional programs will receive written information regarding their registration appointment time. The Registration Timetable is available on the Office of the Registrar’s Website (umdearborn.edu/registration (http://www.umdearborn.edu/registration/)).

Closed Courses
Closed course information will be posted at the Enrollment Services counter (1169 UC) and on the Office of the Registrar’s Website (umdearborn.edu/registration (http://www.umdearborn.edu/registration/)).

Course Load
Students may elect a maximum of 18 credit hours in a given semester. Students should contact their college for policies and procedures.
You may qualify for in-state tuition in any of the following three ways:

1. Residence. By demonstrating that you are a permanent legal resident of the State of Michigan as defined by these Guidelines (see Part I below);

2. Attendance. By demonstrating that you attended an accredited Michigan high school and accredited Michigan middle or junior high school (see Part II below); OR

3. Service. By demonstrating that you or a family member are serving or have served in the U.S. military or Public Health Service (see Part III below).

You may meet the criteria under more than one Part of these Guidelines. However, if you meet the criteria under one of the three Parts, you are not required to determine eligibility under the other two.

I. Establishing Eligibility Through Michigan Residence

You may qualify for in-state tuition by demonstrating that you are a Michigan resident.

A. General Principles

The University of Michigan has autonomous, constitutional authority to establish residency guidelines that apply to the University. The University’s residency guidelines are independent of other state rules or regulations governing residency for other purposes, including income and property tax liability or eligibility to vote or drive.

To qualify for in-state tuition at the University of Michigan on the basis of being a Michigan resident, you must establish that Michigan is your permanent legal residence. In other words, you must establish that the State of Michigan is your home and that you intend to remain in the State permanently. This will depend on, among other things, where you live, work, and attend school; where you have lived, worked, and attended school; where your parents or guardians live; and other evidence that you intend to make Michigan your permanent home.

The Board of Regents of the University of Michigan has charged the Residency Classification Office in the Office of the Registrar on the Ann Arbor campus with determining the residency of current and prospective students for all three University of Michigan campuses. If you are seeking in-state tuition on the basis of residence in the State of Michigan and your application, activities, and circumstances demonstrate that Michigan is your permanent legal residence, you will be classified as a resident. If, however, you seek in-state tuition on the basis of residence but your presence in the State is based on activities or circumstances that are determined to be temporary or indeterminate, you will be classified as a nonresident.

B. Process for Establishing Residency

1. Who Must Submit an Application for Resident Classification?

If you seek to qualify for in-state tuition as a Michigan resident and your application, circumstances, or activities suggest that you may have out-of-state activities or ties (as described below), you will be required to apply to be evaluated and classified as a resident or nonresident. This means completing an Application for Resident Classification truthfully and timely and submitting additional documentation.

Specifically, you must file an Application for Resident Classification if you seek in-state tuition on the basis of Michigan residence and have any of the following out-of-state activities or ties:

- you live outside the State of Michigan for any purpose, including, but not limited to, education, volunteer activities, travel, or employment;
- you attended or graduated from a college outside the State of Michigan;
- you lived or worked outside the State of Michigan at any time within the last three years;
- you are not a U.S. citizen;
- your spouse, partner, or parent is in Michigan as a nonresident student, medical resident, fellow or for military assignment or other temporary employment;
- your are 24 years of age or younger and a parent lives outside the State of Michigan;
- you are 24 years of age or younger and attended or graduated from a high school outside the state of Michigan;
- you attended or graduated from an out-of-state high school and have been involved in educational pursuits for the majority of time since high school graduation.

University of Michigan Guidelines for Qualifying for In-State Tuition

You may qualify for in-state tuition in any of the following three ways:

1. Residence. By demonstrating that you are a permanent legal resident of the State of Michigan as defined by these Guidelines (see Part I below);

2. Attendance. By demonstrating that you attended an accredited Michigan high school and accredited Michigan middle or junior high school (see Part II below); OR

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- you live outside the State of Michigan for any purpose, including, but not limited to, education, volunteer activities, travel, or employment;
- you attended or graduated from a college outside the State of Michigan;
- you lived or worked outside the State of Michigan at any time within the last three years;
- you are not a U.S. citizen;
- your spouse, partner, or parent is in Michigan as a nonresident student, medical resident, fellow or for military assignment or other temporary employment;
- you are 24 years of age or younger and a parent lives outside the State of Michigan;
- you are 24 years of age or younger and attended or graduated from a high school outside the state of Michigan;
- you attended or graduated from an out-of-state high school and have been involved in educational pursuits for the majority of time since high school graduation.

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The Board of Regents of the University of Michigan has charged the Residency Classification Office in the Office of the Registrar on the Ann Arbor campus with determining the residency of current and prospective students for all three University of Michigan campuses. If you are seeking in-state tuition on the basis of residence in the State of Michigan and your application, activities, and circumstances demonstrate that Michigan is your permanent legal residence, you will be classified as a resident. If, however, you seek in-state tuition on the basis of residence but your presence in the State is based on activities or circumstances that are determined to be temporary or indeterminate, you will be classified as a nonresident.

B. Process for Establishing Residency

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Specifically, you must file an Application for Resident Classification if you seek in-state tuition on the basis of Michigan residence and have any of the following out-of-state activities or ties:

- you live outside the State of Michigan for any purpose, including, but not limited to, education, volunteer activities, travel, or employment;
- you attended or graduated from a college outside the State of Michigan;
- you lived or worked outside the State of Michigan at any time within the last three years;
- you are not a U.S. citizen;
- your spouse, partner, or parent is in Michigan as a nonresident student, medical resident, fellow or for military assignment or other temporary employment;
- you are 24 years of age or younger and a parent lives outside the State of Michigan;
- you are 24 years of age or younger and attended or graduated from a high school outside the state of Michigan;
- you attended or graduated from an out-of-state high school and have been involved in educational pursuits for the majority of time since high school graduation.
2. How Will Your Application For Resident Classification Be Evaluated?

If you are required to file an Application for Resident Classification, the University's Residency Classification Office will evaluate the information you provide to determine whether you have presented clear and convincing evidence demonstrating that Michigan is your permanent legal residence. The next sections of these Guidelines are designed to explain in greater detail the standards the Residency Classification Office will apply as your Application for Resident Classification is considered.

a. Circumstances that may demonstrate permanent Michigan residence

The following circumstances and activities, though not conclusive or exhaustive, may lend support to a claim that Michigan is your permanent legal residence:

- Both of your parents or parents-in-law (or in the case of divorce, one parent or parent-in-law) are permanent legal residents of Michigan as demonstrated by permanent employment in the State, establishment of a primary household in Michigan, and severance of out-of-state ties. You must also show that you have severed all out-of-state ties that suggest another state is your legal residence.
- You are employed in Michigan in a full-time, permanent position, your employment is the primary purpose for your or your family's presence in the State, and you have severed any out-of-state ties that suggest another state is your legal residence.
- Your spouse or partner is employed in Michigan in a full-time, permanent position, your spouse or partner's employment is the primary purpose for your family's presence in the State, and you have severed all out-of-state ties that suggest another state is your legal residence.
- Your employment in Michigan is temporary or short-term or of the type usually considered an internship or apprenticeship;
- Your spouse or partner's employment in Michigan is temporary or of the type usually considered an internship or apprenticeship;
- Your spouse or partner's employment in Michigan is permanent but you are in the State for temporary reasons;
- Your employment position in Michigan is normally held by a student;
- You have paid Michigan income tax or filed Michigan resident income tax returns;
- Your relatives (other than parents) live in Michigan;
- You own property or pay Michigan property taxes;
- You possess a Michigan driver's license or voter's registration;
- You possess a Permanent Resident Alien visa;
- You have continuous physical presence in Michigan for one year or more;
- You sign a statement of intent to be domiciled in Michigan.

b. Circumstances that do not demonstrate permanent Michigan residence

The circumstances and activities listed below are most often temporary or indeterminate and do not demonstrate permanent residence in Michigan. Individuals whose claim to Michigan residence is based solely on one or more of the following will generally not be found to be Michigan residents for tuition purposes:

- Your attendance at any University of Michigan campus (Ann Arbor, Dearborn, or Flint) as a nonresident.
- Other circumstances also may require you to file an Application for Resident Classification.

If Michigan is in fact your permanent legal residence, as demonstrated by your admissions application, activities, and circumstances, you have none of the out-of-state activities or ties listed above, and your admissions application truthfully asserts that Michigan is your permanent legal home, you may claim Michigan as your legal residence and will not be required to complete an Application for Resident Classification. The University in its discretion may require you to complete an Application for Resident Classification and submit supporting documentation to determine whether you are a resident or nonresident under the University's Guidelines. The University also reserves the right to audit your information and re-classify you as a nonresident.

c. Immigrants and Aliens

If you are a permanent resident alien, an asylee or refugee, or possess an A, E, G, or I visa, you may be eligible for in-state tuition if you provide official documentation establishing your immigration status and demonstrate that Michigan is your permanent legal residence as defined under these Guidelines. Dependent children who hold an E visa are not eligible to be considered for resident classification. Individuals holding temporary visas, including, but not limited to F, H, J, K, L, Parolee, TN, and TD visas, are not eligible for in-state tuition as a Michigan resident.

d. Dependent Students

You are presumed to be a dependent of your parents if you are 24 years of age or younger and (1) have been primarily involved in educational pursuits, or (2) have not been financially self-supporting through employment.

- If you are a dependent student, and both your parents are legal residents of another state, you are presumed to be a nonresident.
- If you are a dependent, your parents or parents-in-law are divorced, and at least one parent or parent-in-law is a permanent legal resident of the State of Michigan (as defined in these Guidelines), you are presumed to be a resident if you can demonstrate that (a) Michigan is your permanent legal residence and (b) you have severed all out-of-state ties.
- If you are a student living in Michigan with your parents and a permanent legal resident of this State as defined by these Guidelines, you are presumed to retain resident status eligibility even if your parents leave the State if all of the following are true: (1) you have completed at least your junior year of high school before your parents' departure; (2) you remain in Michigan, enrolled full-time in high school or an institution of higher education; and (3) you have not taken steps to establish a legal residence outside of Michigan or any other action inconsistent with maintaining a permanent legal residence in Michigan.

e. Michigan Residents and Absences From the State

You may be able to retain your eligibility for resident classification under the conditions listed below if you are a permanent legal resident of Michigan under these Guidelines and leave the State for certain types of activities. However, if you have been absent from the State, you must file an Application for Resident Classification by the appropriate filing deadline to request resident classification and demonstrate your eligibility.
3. What Documents Must You Submit With Your Application For Resident Classification?

Along with your completed Application for Resident Classification form, you must submit additional documents.

a. All Applicants. All applicants must submit the following additional documents with an Application for Resident Classification:

- copies of your driver’s license and the license(s) of the person or persons upon whom you are basing your claim to resident eligibility;
- copies of the front and signature pages of the most recent year’s federal and state income tax returns and W2 forms for you and the person or persons upon whom you are basing your claim to resident eligibility; and
- any other documentation that supports your claim to resident eligibility.

b. Dependents. If you are claimed as a dependent on federal or state income tax returns, or are presumed to be a dependent under these Guidelines, you must also submit the following documents:

- copies of the front and signature pages of your parents’ most recent year’s federal and state income tax returns, along with accompanying W2s (and Schedule C and E if self employed) along with your parents’ most recent pay stubs showing Michigan income taxes being withheld.

c. Applicants Claiming Residency on the Basis of Employment. If you are seeking to establish that you are a Michigan resident on the basis of your permanent employment in the State, or the permanent employment of your parent, spouse, or partner, you must also submit the following documents:

- a signed letter from the employer, written on letterhead (including phone number), stating the position, status, and dates of employment; and
- a copy of the most recent pay stub showing that Michigan taxes are being withheld.

d. Applicants Born Outside the United States. All applicants born outside the United States seeking to establish eligibility for in-state tuition based on Michigan residency must also submit documents verifying U.S. citizenship or lawful permanent residence in the U.S.

4. Will You Be Required To Submit Additional Documentation?

In addition to the documentation required above, the Residency Classification Office may request additional documentation after the initial review of your application.

5. What Happens To Materials Submitted With An Application For Resident Classification?

Applications and accompanying documentation will be retained by the University of Michigan in accordance with its policies and procedures. All information will be kept confidential to the extent permitted by law.

6. What Information Does the Residency Classification Office Consider?

In making residency determinations, the University considers all information provided with your Application for Resident Classification and any other available information it determines to be relevant.

7. How Do You File An Application for Resident Classification?

Before filing an Application for Resident Classification, you must read Part VI below. The Application for In-State Tuition is available online at the link at the bottom of this page under the Applications for In-State Tuition section. Please read the instructions carefully before submitting your application.

II. Establishing Eligibility by Attending Michigan Schools

You also may qualify for in-state tuition by demonstrating all of the following: (1) you attended an accredited Michigan high school for at least three years and thereafter (a) graduated from an accredited Michigan High School or (b) received a Michigan General Educational Development High School Equivalency Certificate (GED); (2) you attended an accredited Michigan middle or junior high school for the two years preceding high school; and (3) you are commencing your education at the University within twenty-eight months of graduating from the Michigan high school or receiving your GED.

To establish eligibility by demonstrating attendance at Michigan schools, you must complete the following form truthfully and timely: Application for In-State Tuition on the Basis of Attendance. You do not need to be a legal resident of the State of Michigan or United States to qualify under Part II.
III. Establishing Eligibility Through Service

You also may qualify for in-state tuition, without regard to your legal residence, by demonstrating any of the following:

1. you are serving on active duty in the U.S. Army, Navy, Air Force, Marines, National Guard, Merchant Marine, or Coast Guard;
2. you are a reservist in one of those branches;
3. you were honorably discharged or received a general discharge under honorable conditions from one of those branches or their reserve component;
4. you are serving as an officer in the U.S. Public Health Service;
5. you are the spouse or dependent child of someone living or stationed in Michigan who is serving in the U.S. Army, Navy, Air Force, Marines, National Guard, Merchant Marine, or Coast Guard, whether on active duty or as a reservist; OR
6. you are the spouse or dependent child of someone living or stationed in Michigan who is serving as an officer in the U.S. Public Health Service.

To establish eligibility by demonstrating service, you must complete the following form: Application for In-State Tuition on the Basis of Service, truthfully and timely.

IV. Deadlines

It is important to file your materials in a timely fashion. You may apply for in-state tuition for any term in which you are enrolled or intend to enroll. Late applications will be assessed a nonrefundable $300 late fee and will be accepted up to the last published day of classes of the term for which you are applying. Late applications received after the last day of classes will be treated as applications for the following term. In all cases, decisions will be based only on those facts that are in place by the original filing deadline for the term under consideration.

- **Fall Term:** all required materials must be received by 5:00 p.m. on September 30 of that term.
- **Winter Term:** all required materials must be received by 5:00 p.m. on January 31 of that term.
- **Spring, Spring/Summer, and Summer Terms:** all required materials must be received by 5:00 p.m. on July 31 of that term.

If the deadline falls on a weekend or University holiday, all required materials must be received by 5:00 p.m. on the next business day.

These deadlines apply to all University of Michigan schools, colleges, and campuses. For the On-Job or On-Campus program only, filing deadlines are 30 calendar days after the first scheduled day of classes of the term for which you are applying.

V. Appeals

If your request for in-state tuition is denied, you may file an appeal as described below.

The Board of Regents has charged the Appeal Committee with reviewing decisions about eligibility for in-state tuition. The Appeal Committee is chaired by the Vice President and Secretary of the University and includes two other University administrators, a faculty member, and a student. Staff of the Residency Classification Office are not members of the Appeal Committee.

Any appeal must be in writing and must be received by the Appeal Committee no later than 5:00 p.m. on the 30th calendar day following the date of the letter denying your request for in-state tuition. If the deadline falls on a weekend or University holiday, your appeal must be received by 5:00 p.m. on the next business day.

The mailing address for the Appeal Committee is as follows: Residency Appeal Committee, c/o 1210 LS&A Bldg., 500 S. State Street, Ann Arbor, MI 48109-1382.

If there is additional information you would like the Appeal Committee to consider beyond the materials you have already submitted, you should submit that additional information, in writing, with appropriate supporting documentation, with your written appeal. The Appeal Committee may consider the appeal letter and additional documentation along with all the information in your original request.

Personal contact with a member of the Appeal Committee about the subject of your appeal could disqualify him or her from participating in the decision regarding your appeal. The Appeal Committee does not meet in person with students, and appearances on behalf of students are not permitted at appeal meetings.

After the Appeal Committee has completed its deliberations, you will receive the Committee’s final decision in writing. This will conclude the appeal process for the term covered by the application. The University will not conduct any further review of the decision.

VI. Misrepresentations, Falsifications, Omissions; Audits; And Adverse Consequences

Individuals who provide false or misleading information or who omit relevant information in an attempt wrongly to obtain in-state tuition will be subject to severe legal and disciplinary measures, including but not limited to expulsion from the University and retroactive tuition charges. The University routinely audits information and documentation submitted with requests for in-state tuition to ensure compliance.

VII. Where Can You Obtain Additional Information?

For questions on in-state tuition, please contact:

Residency Classification Office
Office of the Registrar
1210 LSA Building
500 South State Street
Ann Arbor, MI 48109-1382
Phone: 734-764-1400

Applications for In-State Tuition

The Application for In-State Tuition is available online. Your access to the online application may depend upon your progress and status in the admissions application process, so please read carefully. In order to log in and complete an application for in-state tuition, you will need:

Your University of Michigan issued eight digit UMID number AND:
1. EITHER a University of Michigan issued uniqname and Ann Arbor/ Kerberos password,
2. OR A Friend Account.
   a. Admitted Students (All campuses) AND all applicants who have previously been issued all of the following: UM ID
number, uniqname and Kerberos password, can authenticate using your uniqname and Kerberos password. NOTE: see footnote 1 if you need to reset your password.

Application for In-State Tuition: csprod.dsc.umich.edu/services/residency (https://csprod.dsc.umich.edu/services/residency/)

b. Applicants not yet admitted, or with no previously issued uniqname or password must apply using a verified Friend Account:
   i. Create a Friend Account: (friend.weblogin.umich.edu/friend/ (https://friend.weblogin.umich.edu/friend/))
   ii. Verify your Friend Account via Wolverine Access: wolverineaccess.umich.edu (https://wolverineaccess.umich.edu/)

Locate the New & Prospective Student Business (N&PS) link under the Students section on the Wolverine Access homepage. After logging in with your Friend Account and password, you will be immediately prompted to complete the one-time only Identity Verification steps (add University of Michigan ID (UMID) and birthdate). Once done, you will be prompted to Sign Out; this will bring you back to the Wolverine Access homepage. Navigate back to the N&PS link, and locate the link to the online In-State Tuition Application in the lower right of the page, or, you can login later using the Application for In-State Tuition link above; this will bring you directly to the application.

1 Ann Arbor/Kerberos Password:
For Flint and Dearborn students, this is NOT the password used to login to your campus’ Banner student information system (SIS). This is unique to the Ann Arbor campus. If you have been admitted and have a uniqname but are unable to log in to create an application, you might need to re-set your Ann Arbor/Kerberos password. Password assistance is different for each campus:
   • Dearborn campus students click here (https://umdearborn.edu/offices/information-technology-services/accounts-passwords/passwords/) for help and instructions for changing your password.
   • Flint campus students click here (https://helpdesk.umflint.edu/customer/portal/articles/1627949-umich-password-usage-restrictions-and-how-to-change-it/) for help and instructions for changing your password.
   • Ann Arbor campus students click here (http://www.itcs.umich.edu/help/faq/uniqnames.php) if you need assistance with your password.

2 Friend Account Information:
Detailed instructions for setting up a Friend Account are provided at this link: itcs.umich.edu/friend (http://www.itcs.umich.edu/friend/)

PLEASE BE AWARE: If you originally logged in using a Friend Account and have since been admitted, your uniqname will be issued and the Friend Account log in will be disabled. You should be able to access your in-state tuition application information using your uniqname and password.

Need Help?
Please contact the ITS Service Center (4Help@umich.edu or 734-764-4357) if you encounter any login issues.

If you wish to check the status of an already submitted application, please do so through your Wolverine Access account: Students–Student Business–Residency.

Transcripts

Transcript Information
A transcript is a student’s complete academic record at the University of Michigan-Dearborn. The transcript(s) that were presented for admission have become an integral part of the files of the admitting offices and cannot be released, either directly or for copying purposes. It will be necessary for you to write directly to the institutions concerned to obtain copies of those previous records. In addition, documents such as SAT/ACT scores are not available from Enrollment Services/Registration & Records. Transcripts will be released only upon written request of the student. Requests are processed within three to five business days. Under certain circumstances, such as the end of the term or upon graduation, requests may take longer to process. Requests will not be processed if you have any financial obligation outstanding to the University. No fee is required for standard delivery transcripts.

Types of Transcripts:
Official Transcripts are printed on special paper with the Registrar’s signature. Official transcripts given directly to a student will be stamped Issued to Student and may not be accepted by other universities.

Unofficial Transcripts are printed on plain paper and marked Student Copy.

Rackham Transcript Information
Students who attended Rackham, Winter 1998 through the present may direct the transcript request to the Dearborn campus as indicated above under “Dearborn Transcript Information.”

Students who attended Rackham prior to Winter 1998 or have graduated prior to January 1998 from the Rackham Graduate School must direct the transcript request to:

University of Michigan
Transcript Department
555 LSA Building
Ann Arbor, MI 48109-1382
Fax: 734-764-5556

Rush Transcript Information
Students may request a rush copy of their transcript in person at the Enrollment Services counter. A $10.00 rush fee per transcript (cash or check only) will be required at the time of the request. Requests received prior to 12:00 noon will be ready for pickup on the same day after 4:00 p.m. Requests received after 12:00 noon will be available for pickup the following day after 12 noon.

Web Transcript Information
Students are able to view and request transcripts online via the UM-Dearborn Connect (http://web-sis.umd.umich.edu/) system. Please visit the Online Transcript Instructions (http://umdearborn.edu/r_home.html) page for more information.
Tuition Assessment and Fee Regulation

Tuition and fees are subject to the approval of the Regents of the University and are subject to change at any time.

Policies Governing Student Tuition and Fees

The Board of Regents shall determine the level of tuition and fees and a schedule of such shall be published. All other student tuition and fees shall be fixed by the Campus Fee Committee.

Payment of Tuition and Fees

All tuition and fees are payable in accordance with regulations established by the University providing only that said regulations may not defer payment beyond the end of the term for which they are assessed.

Payment for tuition and fees may be made in full at the Student Accounts Office, or online, after registration. The laboratory and/or course fees are refundable if the course is dropped during the first two weeks of a full term, the first week of a half term or mini-term, or before the second class meeting of a less than one-month mini-term. The procedure for obtaining a refund is described in the section "Change of Fees and Refunds."

Application Fees

Graduate degree-seeking applicants must submit a $60 application fee. The application fee is nonrefundable and cannot be credited toward tuition or any other fees. When applying via the online application, the application fee can be paid by credit or debit card (Visa, MasterCard, or Discover). If a paper application is submitted, the $60 fee must be paid via check or money order (payable to UM-Dearborn).

Graduate non-degree or guest applications do not require a fee.

Undergraduate applicants are not charged an application fee regardless of how they apply.

Students who have paid the appropriate application fee at another campus of the University will not be assessed a second fee.

Course Level Assessment

Undergraduate students electing Graduate course(s) will be assessed at the Graduate Tuition rate for the graduate course(s). Graduate courses are numbered 500 and above. (Effective Winter 2007)

Graduate students electing Undergraduate course(s) will be assessed at the Undergraduate Tuition rate for Undergraduate course(s). Undergraduate courses are numbered 499 and below. (Effective Fall 2006)

Please note: This tuition assessment is dependent on various factors and a change in tuition may not occur for some students.

Dual Status Tuition and Fees: Graduate And Undergraduate

Seniors who are within six hours of completing the requirements for graduation and who have been admitted to a UM-Dearborn graduate program may, with both undergraduate and graduate advisors' approval, register simultaneously in a UM-Dearborn undergraduate unit and in a graduate program. Tuition and fees will be assessed at the graduate program level for graduate courses and the undergraduate program level for undergraduate courses.

Dual Enrollment Tuition and Fees: On Two Campuses Of The University

A student electing courses at UM-Dearborn and at another campus of the University, by means of a "Guest Admission," will pay the appropriate tuition and fees at each campus. The only exception is that the student will not be assessed tuition and fees totaling more than a full program tuition and fees at whichever campus may have the higher full program tuition and fees.

Undergraduate Credit By Examination (CBE)

See the Special Examinations in the Policies section.

Laboratory and/or Course Fees

Students will be assessed a laboratory or course fee if enrolled in any of the courses so designated in the Schedule of Classes (e.g., "Lab fee $50.00").

Late Registration Assessment

A late registration assessment of up to $45 will be assessed for anyone registering later than two weeks (one week for a half term) after the first day of classes. It should be noted that students are not ordinarily permitted to register after the first two weeks of a full term, the first week of a half term or mini-term, or after the second class meeting of a less than one-month mini-term.

In exceptional cases, a student might be permitted to enroll even after the first two weeks (and be charged a late fee) if the student has obtained the written approval of the dean (or a designated representative) of the college or school. Late registrants not pursuing a degree (PDS/PEs) must have the approval of both the Office of Academic Support and Outreach Services and the Registrar, as well as the approval of any instructors involved.

Fees Included Within Tuition

The tuition and fees assessed by the University include a nominal charge for parking and other transportation-related services, information technology services, the health referral service to the Henry Ford Hospital-Fairlane Clinic, facilities debt service, and support for student activities and organizations.

Exemption From Payment Of Fees

No exemption from the payment of fees shall be granted. Failure to fulfill financial obligations to the University may result in disciplinary action, including the withholding of degrees and transcripts.

New Student Fee

The New Student Fee of $75.00 is charged to all new incoming degree-seeking students at the time of registration. The fee will be automatically posted to the student's account. This fee covers operational expenses required to deliver high-quality orientation programming for students. It also includes the administration of placement exams, regardless of participation in these activities. The New Student Fee is non-refundable.
unless a student withdraws from all courses in his/her first term on or before the end of the drop/add period (the first two weeks of the term).

**Tuition and Fees**

Students should obtain current tuition and fee information from the Office of the Registrar’s Tuition & Fees webpage, umdearborn.edu/rr_tuition-fees (http://www.umdearborn.edu/rr_tuition-fees/).

**Additional Assessments**

Course levels 300 and above are assessed an additional amount per credit hour. For current tuition and fee information, students should consult the Office of Registrar’s Tuition & Fees webpage, umdearborn.edu/rr_tuition-fees (http://www.umdearborn.edu/rr_tuition-fees/).

**Special Tuition and Fee Adjustments**

The Registrar and the Provost for Academic Affairs are authorized to make adjustments in the application of the policy stated above when, in their judgment, unusual circumstances warrant such action. Circumstances that may warrant special consideration include the death or serious illness of the student. The student who wishes to have his/her case reviewed must petition and submit documentation to the Office of the Registrar, Room 1169, University Center, either in person or by mail. It is the responsibility of the student to make sure that required documents are submitted.

Except in rare and unusual circumstances, petitions will not be accepted after the last day of classes for the term concerned. Additionally, petitions will not be accepted once an account has been turned over for collection.

**Enrollment Verification**

*Enrollment Verification requests cannot be processed prior to the term’s official start date.*

When a loan agency, student loan provider, employer, insurance agency, etc. requires proof that a student enrolled at the University of Michigan-Dearborn, the Office of Registration & Records, at the students request, can provide an Enrollment Verification.

**Loan Deferments**

The University of Michigan-Dearborn uses the National Student Clearinghouse as the service for verifying enrollment for student loans. These verification requests will be processed by that agency within 10 business days of receipt of request at the Office of Registration & Records. Enrollment Verification request forms are available at the Office of Registration & Records, 1169 University Center, during regularly scheduled office hours or via this website. When requesting verification for a student loan, you must submit the official forms sent to you by the loan agency along with your request to the Office of Registration & Records.

**All Other Requests**

The Office of the Registrar processes requests for verification, excluding student loan deferments. Requests are accepted via mail, fax, or UM-Dearborn Connect (online). If you are requesting enrollment verification on a document that you have received, use the Printable Enrollment Verification Request Form, complete it, and mail, email (attach Enrollment Verification Request Form) or fax it along with the document to the Office of the Registrar.

**Scale**

The following scale is used when verifying student enrollment status at UM-Dearborn:

<table>
<thead>
<tr>
<th>Status</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time</td>
<td>12 or more hours</td>
<td>8 or more hours</td>
</tr>
<tr>
<td>Three-Quarter Time</td>
<td>9-11 hours</td>
<td>6-7 hours</td>
</tr>
<tr>
<td>Half Time</td>
<td>6 to 8 hours</td>
<td>4-5 hours</td>
</tr>
<tr>
<td>Less Than Half Time</td>
<td>5 or less hours</td>
<td>3 hours or less</td>
</tr>
</tbody>
</table>

Please forward completed Printable Enrollment Verification Request Forms to:

University of Michigan-Dearborn
Office of the Registrar
1169 UC
4901 Evergreen Road
Dearborn, MI 48128-2406

Or Fax to:

University of Michigan-Dearborn
Office of the Registrar
313-593-5697

**Veteran Affairs**

The goal of the Office of Veteran Affairs is to provide support to a diverse community of student veterans and enhance the experience of veterans as they move through our academic programs. We accomplish this mission by:

- Providing academic assistance and tutoring
- Coordinating access to Counseling and Disabilities Services
- Providing veteran specific enrollment and certification services
- Maintaining a dialog with the Student Veterans of America Chapter and the Association of Women Veterans
- Retaining points of contact in Financial Aid, Cashiers/Student Accounting, and Enrollment Services/Registration & Records
- Forging partnerships with business, industry, educational institutions, and government agencies.
- Scheduling veteran specific events

The veteran’s office space provides a friendly environment for our active duty military and veterans to study, relax, socialize, converse, or just gain a moment of quiet reflection. Whether you were just discharged from active duty, currently on active duty, in the National Guard or Reserves, or a spouse or dependent of a disabled veteran, we will help you with your transition and academic goals. The Office of Veteran Affairs is located in the University Center in room 2174.

**Certification of Educational Benefits**

The administration of veteran’s education benefits programs and enrollment certifications are handled by Veteran Affairs Certifying Officials located in the Office of the Registrar. Our goal is to effectively assist veterans, or the dependents of veterans, with the certification process. Students who are eligible for VA educational benefits are able to apply their respective benefits toward their educational endeavors at UM-Dearborn with assistance from this office.
All students who are eligible for, and elect to receive education and training benefits while attending UM-Dearborn, may address inquiries for information to the:

Office of the Registrar
4901 Evergreen Road
1169 University Center
Dearborn, MI 48128
313-583-6500 or umd-va@umd.umich.edu.

Additional information regarding veteran services, certification, and the policies and procedures for certification of benefits can be found on our website at: umdearborn.edu/students/registration-records/veteran-affairs-certification Questions regarding the eligibility of a veteran or dependent can be answered by calling the St. Louis Regional Office at 1-888-GIBILL1 (442-4551) or connecting to the Department of Veteran Affairs website at: benefits.va.gov/gibill (http://www.benefits.va.gov/gibill/).

College of Arts, Sciences, and Letters

Arts, Sciences, and Letters the Liberal Arts College at the University of Michigan-Dearborn

With a curriculum steeped in the liberal arts and sciences, CASL provides students with the necessary foundation to excel in their academic pursuits and to make a difference in the world beyond the classroom.

CASL’s varied undergraduate and graduate academic programs reflect our commitment to leadership, learning and student success. Various opportunities for interdisciplinary work, academic service learning, internships, and co-ops mean that our students leave this campus prepared not just for employment but for life.

CASL is home to five graduate programs and 37 undergraduate majors. Undergraduate programs range from Women’s and Gender Studies to Biochemistry, English to Environmental Science, Mathematics to International Studies, and Political Science to Criminal Justice. With our rich array of majors and minors in addition to certificate programs and an Honors Program, CASL offers a transformative experience which prepares citizens with a wide and critical perspective, a deep appreciation for humanity’s achievements, and the creative bent necessary for tomorrow’s work.

History of the College

From the beginning of the Dearborn Center of the University of Michigan, as it was first called, there was “an intent to provide a full schedule of daytime courses in Engineering, Business Administration, and the Liberal Arts and Sciences” (Report by the University’s Dean of Statewide Education, January 1957). On January 10, 1958, the Regents approved the creation of the Division of Literature, Science, and the Arts (LSA) as an official academic division. Full programs in the liberal arts began in Fall 1960; and in Fall 1965, the LSA Division became the largest academic unit on the Dearborn Campus, a distinction which continues to the present.

When it became a four-year undergraduate institution in 1971, the Campus was designated the University of Michigan-Dearborn (UM-Dearborn). Two years later, the Regents approved a new set of UM-Dearborn Bylaws, in which the Department of Education became a separate division, and the LSA Division became the College of Arts, Sciences, and Letters (CASL), administered by a Dean. Since then, CASL has evolved to comprise six multidisciplinary departments: Behavioral Sciences; Mathematics and Statistics; Language, Culture and Communication (LCC); Literature, Philosophy and the Arts (LPA); Natural Sciences; and Social Sciences. CASL is also home to fourteen college wide programs: African and American African Studies (AAAS); Arab American Studies (AAST); Behavioral and Biological Sciences (BBS); Business Studies as a Second Major (BST); Criminology and Criminal Justice Studies (CRJ); Individual Program of Study (IPS); Integrative Studies (INTG); Law and Society; LGBTQ Studies; Medieval & Renaissance Studies; Middle East Studies (MEST); Religious Studies (RELS); Science and Technology Studies (STS); and Women and Gender Studies (WGST).

Mission of the College

The College of Arts, Sciences, and Letters is a transformative student-centered exploratory learning environment, regionally and globally focused, and deeply grounded in the values of inclusiveness and engagement, and informed by leading edge research. We develop and empower students to become future leaders who will guide the resurgence and renewal of southeastern Michigan and the world beyond.

Vision Statement

The College of Arts, Sciences, and Letters aspires to be the premier public liberal arts college in Michigan attracting individuals from all backgrounds and career interests and transforming their lives through education in mathematics, the humanities, and the social, behavioral and natural sciences.

Organization of the College

Among the three liberal arts colleges on the University of Michigan campuses (Ann Arbor, Dearborn and Flint), our College stands out because it is organized in a unique manner. Instead of being fragmented into many traditional single-discipline departments, the College is mainly organized into six multidisciplinary departments: Behavioral Sciences; Mathematics and Statistics; Language, Culture and Communication; Literature, Philosophy and the Arts; Natural Sciences; and Social Sciences.

The Behavioral Sciences Department houses and offers degree programs in three disciplines: anthropology, psychology, and sociology. The Department also offers an interdisciplinary degree program in behavioral sciences and a graduate program in Health Psychology. The office of the Behavioral Sciences Department is located in Room 4012, CB.

The Department of Language, Culture, and Communication (LCC) offers courses and programs in communication, comparative literature, composition, film studies, journalism, linguistics, modern & classical languages (Arabic, Armenian, Chinese, French, German, Greek, Latin, and Spanish), and speech. These courses and programs offer a basis for the acquisition of knowledge and skills related to the uses and analysis of language in multiple cultural and communicative contexts. Students hone their skills in speaking, writing, and understanding language. They also gain rich lenses for analyzing language in all its forms—from public relations campaigns to globally disseminated films, political speeches to the literature of other cultures, from global popular culture to news reports to the worldwide use and transformation of English. Faculty in LCC are dedicated teacher-scholars, committed educators who are recognized experts in their fields. To support its programs in Modern languages, the Department houses the Kochoff Foreign Language Media Laboratory (3065 CB) with extensive resources for language learning.
such as audio and video course materials, foreign language writing assistant programs, and foreign language TV programs via satellite. To support its programs in Communications, the department houses a TV studio, an audio lab, and video editing facilities with state-of-the art software, as well as a dedicated computer classroom (3034 CB) with 24 workstations. The office of the Language, Culture and Communication department is located in Room 3014, CB.

The Department of Literature, Philosophy, and the Arts (LPA) at the University of Michigan-Dearborn offers courses and programs in English and American literature, philosophy, art history, applied art, music, and music history. These courses and programs examine the legacy of the human experience and stress the traditions of free intellectual inquiry, critical thinking and ethical behavior. The department seeks to develop students’ ability to engage in analysis and evaluation of texts and artifacts and to articulate their opinions effectively in oral and written form. Students receive personal supervision from senior faculty who are recognized experts in their fields. The Literature, Philosophy, and the Arts Visual Resources and Music Collections (VRMC) supports the instructional needs of the department, especially art history, applied art (studio art), and English literature. The collection contains over 95,000 analog slides, 1500 compact discs and phonograph records, 200 videocassettes and other instructional materials. Digital images from the VRMC collection are available from the Image Collections supported and maintained by Digital Library Platform Service (DLPS) (https://www.lib.umich.edu/digital-library-platform-services-dlps/). The office of the Literature, Philosophy, and the Arts Department is located in Room 3011, CB.

The Mathematics and Statistics Department offers a degree programs in the disciplines of applied statistics and mathematics, with an emphasis on either pure or applied mathematics. In addition, the Department offers an interdisciplinary major in Actuarial Mathematics, minors in Applied Statistics, Computer and Computational Mathematics, Mathematics, and a certificate in Mathematics for Finance. The Mathematics Placement Exam and the Mathematics Learning Center are both administered by the Department. The office of the Mathematics and Statistics Department is located in Room 3014 CB.

The Natural Sciences Department houses and offers degree programs in three disciplines: biological sciences, chemistry, and physics. The Department also offers interdisciplinary degree programs in biochemistry, chemistry instruction, geological sciences, environmental science, environmental studies, integrated science, and microbiology; geology and astronomy are available as minors. Also available is the science, environmental studies, integrated science, and microbiology; biochemistry, chemistry instruction, geological sciences, environmental science, environmental studies, integrated science, and microbiology; geology and astronomy are available as minors. Also available is the Geospatial Analysis and Mapping (GAM) certificate program. The Science Learning Center, the greenhouse, and the observatory are administered by the Department. The office of the Natural Sciences Department is located in Room 114, Science Faculty Center.

The Social Sciences Department is home to the academic disciplines of Economics, History, Political Science, and Geography as well as interdisciplinary programs. The Department of Social Sciences is home to the Economics, History, and Political Science disciplines; interdisciplinary programs in Urban & Regional Studies, Community Change Studies and Social Studies; a master’s degree program in Public Administration and Policy; and Geography unit. Supplementing these academic areas are various internship opportunities for students through our Public Affairs, Economics and Ottawa Internship Programs. The Social Sciences Department also hosts an ongoing Research Colloquium and a Mid-East Lecture Series. These diverse opportunities share a focus on the forces that have been affecting human individuals and groups in an ever-changing and increasingly complex world. The office of the Social Sciences Department is located in Room 2140 Social Sciences Building.

The world today is an interdisciplinary world. Responding to the challenges we face as a region, a nation, and a planet requires the perspectives of multiple disciplines. CASL is home to a number of interdisciplinary programs that bring together faculty and students from different departments to study these challenges. These include degree programs in African African American Studies, Criminality and Criminal Justice Studies, Individual Program of Study, Integrative Studies, and Women’s and Gender Studies, and minors in African and African American Studies, Law and Society, Leadership and Communication in Organizations, Medieval/Renaissance Studies, Organizational Change in a Global Environment, Religious Studies, Science and Technology Studies, Social Science Research Methodology, and Society and Technological Change. The College also supports the Honors Program, coursework in Arab and Arab American Studies, a program for study in Japan, and the Cooperative Education Program. These College-Wide Programs not only offer academic majors, minors and certificates, they also sponsor many of the events and activities that make UM-Dearborn an intellectually exciting place responsive to the needs and concerns of our metropolitan region.

Degrees Offered

Students may obtain a Bachelor of Arts (AB) or Bachelor of Science (BS), from CASL.

A liberal arts degree program affords a student both breadth and depth of learning. The course requirements for a degree may be divided into types: courses that give a broad, general education, those that provide depth in a specialization, and those that offer the tools needed for success in college and life.

Dearborn Discovery Core (DDC) and Foreign Language

Students admitted to the College follow the Dearborn Discovery Core (DDC) curriculum to meet their general education requirements (see General Information Section). Students meeting MTA should consult a CASL Advisor for review of their remaining DDC requirements.

Foreign Language (8 hrs)

All BA and BS students are required to take a two-course sequence in one language. Integrative Studies students are exempt from the Foreign Language requirement.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARBC 101</td>
<td>Beginning Arabic I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; ARBC 102</td>
<td>and Beginning Arabic II</td>
<td></td>
</tr>
<tr>
<td>CHIN 101</td>
<td>Beginning Chinese I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; CHIN 102</td>
<td>and Beginning Chinese II</td>
<td></td>
</tr>
<tr>
<td>FREN 101</td>
<td>French Language &amp; Culture I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; FREN 102</td>
<td>and French Language &amp; Culture II</td>
<td></td>
</tr>
<tr>
<td>GER 101</td>
<td>German Language and Culture I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; GER 102</td>
<td>and German Language and Culture II</td>
<td></td>
</tr>
<tr>
<td>LAT 101</td>
<td>Beginning Latin I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; LAT 102</td>
<td>and Beginning Latin II</td>
<td></td>
</tr>
<tr>
<td>MCL 111</td>
<td>Armenian I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; MCL 112</td>
<td>and Armenian II</td>
<td></td>
</tr>
</tbody>
</table>
The foreign language distribution requirement can be met by:

- Successfully completing a two-semester beginning language sequence at UM-Dearborn, or
- Transferring the equivalent of 8 semester hours of a beginning language sequence from another college or university, or
- Successfully completing a 3- or 4-semester hour foreign language course (this course cannot be taught in English) at the 102 level or higher, or
- Having completed at least 3 years (in the same language) of foreign language in high school with a grade of C or better in the final course, or
- Having completed the equivalent of a high school diploma at a school that used a language other than English for instruction. (Appropriate documentation attesting to the language of instruction and graduation from the high school program is necessary, and official English translations of foreign transcripts must be provided), or
- Passing an oral and written proficiency exam.

A student with prior knowledge of Arabic, French, German or Spanish should take a placement examination before registering for a course in that language. Placement/proficiency exams in Arabic, French, German, and Spanish are scheduled through the Office of Admissions and Orientation; call 313-593-5100. A student wishing to take a proficiency exam in a language not mentioned above or not taught at UM-Dearborn should consult a CASL advisor; call 313-593-5293 for more information. Proficiency exams for a language other than those taught at UM-Dearborn must be administered at another four-year institution. A student wishing to waive the foreign language requirement must officially submit a request via petition. Please note that when the requirement is waived, or proficiency is demonstrated by exam, credit will not be awarded for courses not taken.

### Majors

#### What is a Major?

A college degree experience includes depth as well as breadth. Each student in an AB (Bachelor of Arts) or BS (Bachelor of Science) degree program must choose a field in which to specialize, which is called a major. A major is a program of specialized study that normally consists of a minimum of 30 credit hours of work at the upper-level level (courses numbered 300 through 499 and 3000-4999) taken mainly during the student’s final two years. A major allows a student to develop independence and discrimination of thought and judgment and to learn to appreciate, assimilate, and apply a coherent body of knowledge.

The College offers the following majors that normally lead to the degree AB (Bachelor of Arts) or BS (Bachelor of Science) listed:

<table>
<thead>
<tr>
<th>Major</th>
<th>Degree(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial Mathematics</td>
<td>AB, BS</td>
</tr>
<tr>
<td>African and African American Studies</td>
<td>AB</td>
</tr>
<tr>
<td>Applied Statistics</td>
<td>AB, BS</td>
</tr>
<tr>
<td>Anthropology</td>
<td>AB</td>
</tr>
</tbody>
</table>

**Art History** AB
**Behavioral and Biological Sciences** AB, BS
**Behavioral Sciences** AB
**Biochemistry** BS
**Biological Sciences** BS
**Business Studies (2nd Major ONLY)** AB, BS
**Chemistry (ACS Certified)** BS
**Chemistry/Instructional** BS
**Communication** AB
**Criminology and Criminal Justice** AB
**Economics** AB
**English** AB
**Environmental Science** BS
**Environmental Studies** AB
**French Studies** AB
**Geological Science** BS
**Hispanic Studies** AB
**History** AB
**Individual Program of Study** AB, BS
**Integrative Studies** AB, BS
**International Studies** AB
**Journalism and Screen Studies** AB
**Mathematics** AB, BS
**Microbiology** BS
**Philosophy** AB
**Physics** BS
**Political Science** AB
**Psychology** AB
**Social Studies** AB
**Sociology** AB
**Urban and Regional Studies** AB
**Women’s and Gender Studies** AB

1. Integrative Studies offers the student an opportunity to design an AB or BS degree program from three 12 or 15+ credit hour fields of study called Concentrations.

#### Major Requirements

Certain introductory courses, designated as pre-major or prerequisites, are designed to give students the knowledge and skills needed in the advanced courses. Undecided students will find these courses helpful in making a decision about majoring in the field.

A program of study in a major should be planned in consultation with a CASL academic advisor and faculty program mentor.

The following rules apply to most majors:

1. Generally in most single discipline majors, at least 30 upper-level credit hours are required. At least 24 credit hours must be taken in the field of the major and some majors require at least 6 credit hours of cognate courses. A cognate course is in a related field.
2. The courses used to fulfill the 30 or more upper-level credit hours must be numbered 300-499 or 3000-4999. Note that courses taken at community colleges and lower level courses taken at other four-year institutions may not be used to fulfill this requirement.
3. Courses taken as pre-major/prerequisites may not be counted in the major.
4. A minimum grade point average (GPA) of 2.00 must be achieved in both major courses and cognate courses.
5. At a minimum, students must complete between 12 and 15 (or more) of the 30 credit hours at UM-Dearborn. Students transferring upper-level credits from other institutions should check with their academic advisor for specifics of this residency requirement.
6. Students who have been off campus for one full year must complete the degree requirements in effect when they return.
7. Courses used in the major cannot dually be used in a minor.
8. Courses used in the major or minor cannot be taken P/F (Pass/Fail)

Double Major (Optional)
Students who want a double major must meet all requirements in two fields and must officially declare, and be approved for, both majors, in the CASL Office of Advising and Academic Success, Room 1039 CB. Courses that satisfy major and/or cognate requirements for more than one field can be applied simultaneously to both fields. The Business Studies major may only be a second major.

Recognition of A Minor (Optional)
A student in an AB or BS degree program (other than Integrative Studies) may apply for recognition of a minor. A student may declare a minor (completed or not) by filing the appropriate form at the CASL Advising and Academic Success office. A final audit will be conducted at the time of graduation. Any posted minor that has not been successfully completed will be deleted from the student’s transcript.

A minor generally consists of a minimum of 12-18 credit hours of upper-level (300-499 and 3000-4999) coursework in a particular field of study. A minimum grade point average (GPA) of 2.00 is required in the courses applied to a minor. For minors offered by CASL, the grades (including E’s) in all upper-level courses in the discipline of the minor will be reflected in the minor GPA. Courses elected pass/fail (P/F) cannot be used in a minor. Courses used in a minor cannot dually be used in a major. No more than three credit hours of transfer credit, field placements, internships, seminars, S/E-graded courses, and independent study/research may be applied to any 12 credit hour minor, and no more than six credits for a 15+ credit hour minor.

Not all CASL majors are available as a minor. Furthermore, there are some areas of study that are only available as a minor. CASL students may also choose from several minors from outside of the College: Accounting, Computer and Information Science (CIS), CIS-Game Design Option, Digital Marketing, Entrepreneurship, Finance, Financial Planning, Health Policy Studies, Human Resources Management, Information Systems Security, Information Systems Management, Management, Marketing, Public Health, Social Work, and Supply Chain Management. The GPA for the CIS minor is based on CIS 150, CIS 200, CIS 275, and all upper-level CIS coursework. The GPA for the Business minors is based on all courses taken for the minor in the College of Business. Students who are not in the College of Business cannot elect or transfer more than 30 credit hours in upper level courses offered by the College of Business. A maximum of six credit hours of transfer credit, field placement, internships, seminars, S/E-graded courses, and independent study/research may be applied to any non-CASL minor.

Degree Requirements: Summary
Bachelor of Arts (AB)
To be recommended for the AB degree a student must have satisfied the DDC and Foreign Language requirements, residency, credit hours, grade point average, and upper-level work. For all programs except Integrative Studies, the student must also complete the requirements for the major. The AB degree in Integrative Studies does not involve a major, but three fields of study called Concentrations. Integrative Studies students do not need to complete the Foreign Language requirement.

Bachelors of Science (BS)
To be recommended for the BS degree a student must have satisfied all the requirements listed above for the AB degree and must have majored in one of the following programs: biochemistry, biological sciences, chemistry (ACS certified), chemistry/instructional, geological sciences, environmental science, microbiology, or physics. Alternatively, a student who earns 60 or more credit hours (at least 20 credit hours of which are in upper level courses 300 or above) in specified STEM or applied sciences coursework may, upon petition to the CASL Advising and Academic Success office, Room 1039 CB, be granted the BS degree in the following majors: Actuarial Mathematics, Applied Statistics, Behavioral and Biological Sciences, Business Studies (as a 2nd major only), Individual Program of Study, Integrative Studies, and Mathematics.

Other Requirements
Total Credit Hours
A minimum of 120 credit hours with an overall average of C (2.00) or better is required for graduation.

Upper-Level Coursework
A minimum of 48 hours of upper-level (courses numbered 300-499 and 3000-4999) coursework must be completed by each student. The College of Arts, Sciences, and Letters does not award upper-level credit to courses taken at a two-year institution except in the following circumstances:

- Courses are articulated as upper-level as part of the MiTransfer Pathways Project.
- Courses are articulated as upper-level as part of a current articulation agreement with the two-year institution. In this case, the upper-level credit is dependent upon the student meeting the criteria of the articulation agreement. If those criteria are not met, the credit will revert to lower-level.

Credit Hour Limitation
There are maximum credit hours in any one discipline which may be applied toward the 120 credit hours needed for graduation. See major requirements for specific rules.

Other Programs
Graduate Programs
The College offers a Master of Public Administration and Policy, a Master of Science in Applied and Computational Mathematics, a Master of Science in Criminology and Criminal Justice, a Master of Science in Environmental Science, and a Master of Science in Psychology with tracks in Health Psychology and Clinical Health Psychology. See the UM-Dearborn Graduate Catalog for admission requirements, complete program descriptions and a listing of graduate courses.
Certificates

Consult the program description in this Catalog for additional information and requirements.

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Administration
Hershock, Martin J., PhD, Dean
Scarlatta, Gabriella M., PhD, Associate Dean
Lachance, Michael, PhD, Associate Dean
Bachir, Nada, BA, Assistant to the Dean
Gassel, Susanne, MA, Director, CASL Advising and Academic Success
Gedert, Susan, BA, Communications Editor & Alumni Affiliate Coordinator
Gordon, Rita, PhD, Administrative Director
Judge-Gonzalez, Ellen, MA, Director, Student Outreach and Academic Resources (SOAR Program)
Kelly-Williams, Christine, BA, Business Process Analyst
Martin, Patricia, MPA, Cooperative Program Manager
Lennon, Nicole, BA, Administrative Assistant
Yuncker, Morgan, BA, Outreach Marketing and Event Coordinator

Chairs and Directors
Banner, Francine, Director, WILL Program
Benore, Marilee, Director, Behavioral and Biological Sciences
DeGregorio, Scott, Director, Honors Program
Forsyth-Brown, Ivy, Director, African American and African Studies and Center for Ethnic and Religious Studies
Georgieva-Hristova, Yulia, Director, Applied and Computational Mathematics
González del Pozo, Jorge, Chair, Language, Culture, and Communication and Director of International Studies
Howell, Sally, Director, Center for Arab American Studies
Lawson, Daniel, Director, Masters of Science - Environmental Science
Leonard, Michelle, Director, Psychology Graduate Program
Martin, Lisa, Director, Women’s and Gender Studies
Mogan, Sven, Chair, Natural Sciences
Remski, Joan, Chair, Mathematics and Statistics
Rusch, Lara, Director, Urban and Regional Studies Program
Sanjian, Ara, Director, Center for Armenian Studies
Shelton, Donald, Director, Criminology and Criminal Justice
Smith, Jonathan, Chair, Behavioral Sciences
Smith–Pollard, Deborah, Chair, Literature, Philosophy, and the Arts
Susko, David, Director, Environmental Interpretative Center
Taylor, John, Director, Writing Center
Thomson, Dale, Chair, Social Sciences

Professors Emeriti
Akiyama, Michael, PhD, Professor Emeritus Psychology
Anderson, Donald F., PhD, Professor Emeritus Political Science
Axsom, Richard, PhD, Professor Emeritus Art History
Bjorn, Lars, PhD, Professor Emeritus Sociology
Bogin, Barry A., PhD, Professor Emeritus Anthropology
Bond, Donald J., PhD, Professor Emeritus Physics
Brown, James W., PhD, Professor Emeritus Mathematics
Clark, Elaine G., PhD, Professor Emerita History
Constant, John G., PhD, Associate Professor Emeritus Music
Crowell, Elizabeth, PhD, Associate Professor Emerita Economics
Dahike, Richard M., PhD, Professor Emeritus Mathematics and Mathematics Education
DeCamp, Mark, PhD, Associate Professor Emeritus Chemistry
Emery, Allan, PhD, Professor Emeritus Chemistry
Fakler, Robert, PhD, Professor Emeritus Mathematics
Fink, John F., PhD, Professor Emeritus Mathematics
Flax, Neil M., PhD, Associate Professor Emeritus Comparative Literature and German
Gardner, Gerald, PhD, Professor Emeritus Psychology
Garland, Frank, PhD, Associate Professor Emeritus Chemistry
Gillespie, John A., PhD, Professor Emeritus Mathematics and Statistics
Grewe, Eugene, PhD, Professor Emeritus Rhetoric and English Composition
Gruber, James, PhD, Professor Emeritus Sociology
Heady, Judith, PhD, Associate Professor Emerita Biology
Higgs, Elton, PhD, Professor Emeritus English Language and Literature
Höft, Margret, PhD, Professor Emerita Mathematics
House, Gloria, PhD, Professor Emerita African and African American Studies and Humanities
Jacobs, Claude, PhD, Associate Professor Emeritus Behavioral Sciences
James, David A., PhD, Professor Emeritus Mathematics
Kamachi, Noriko, PhD, Professor Emerita History
Klein, Bernard W., PhD, Professor Emeritus Political Science
Kotre, John, PhD, Professor Emeritus Psychology
Lee, Dorothy A., PhD, Professor Emerita Comparative Literature and English
Lempert, Lora Bex, PhD, Professor Emerita Sociology
Lyjak, Robert, PhD, Professor Emeritus Mathematics and Computer Science
Massey, Frank J., PhD, Associate Professor Emeritus Mathematics and Computer Science
Milles, Stephen, PhD, Associate Professor Emeritus Mathematics and Mathematics Education
Moerman, Daniel, PhD, Professor Emeritus Anthropology
Moran, Gerald, PhD, Professor Emeritus History
Morash, Ronald P., PhD, Professor Emeritus Mathematics
Mostafapour, Kazem, PhD, Associate Professor Emeritus Biochemistry and Chemistry
Nadasen, Arunajallam, PhD, Professor Emeritus Physics
Norman, Richard, PhD, Associate Professor Emeritus Biology
Otto, Charlotte, PhD, Professor Emerita Chemistry
Papazian, Dennis, PhD, Professor Emeritus History
Papp, F.J., PhD, Professor Emeritus Mathematics
Pearson, Sheryl S., PhD, Professor Emerita English Literature
Pebworth, Ted-Larry, PhD, Professor Emeritus English Language and Literature
Perlove, Shelley K., PhD, Professor Emerita Art History
Peter, Philip H., PhD, Associate Professor Emeritus Music
Proctor, Donald, PhD, Professor Emeritus History
Radine, Lawrence, PhD, Professor Emeritus Sociology
Rahman, Ahmad, PhD, Associate Professor Emeritus (posthumously) History
Roehl, Richard, PhD, Professor Emeritus Economics
Rubenstein, Rheta N., PhD, Professor Emeritus Mathematics Education and Mathematics
Sayles, Edward, PhD, Professor Emeritus Philosophy
Schaum, Melita, PhD, Professor Emeritus English Literature
Schneider, Michael J., PhD, Professor Emeritus Biology
Sheldon, Jane, PhD, Professor Emeritus Psychology
Simpson, Robert, PhD, Professor Emeritus Biology and Environmental Science
Snabb, Thomas E., PhD, Associate Professor Emeritus Mathematics and Statistics

Spinelli, Emily L., PhD, Professor Emerita Spanish
Spoiden, Ste’phane, PhD, Professor Emeritus French
Stern, Jeffrey, PhD, Professor Emeritus Psychology
Summers, Claude, PhD, Professor Emeritus English Language and Literature
Tai, Julia C., PhD, Professor Emerita Chemistry
Tentler, Leslie W., PhD, Professor Emerita History
Thomson, William, PhD, Associate Professor Emeritus Psychology
Twomey, Michael, PhD, Professor Emeritus Economics
Vansant, Jacqueline, PhD, Professor Emeritus German
Verhey, Roger, PhD, Professor Emeritus Mathematics
Woodward, Wayne, PhD, Associate Professor Emeritus Communication

Faculty

College Wide Programs
Barak, Maya, PhD, American University, Assistant Professor Criminology and Criminal Justice
Brainer, Amy, PhD, University of Illinois at Chicago, Assistant Professor Women’s and Gender Studies and Sociology
DeGregorio, Scott, PhD, University of Toronto, Professor Honors and English
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Laws, Terri, PhD, Rice University, Assistant Professor African and African American Studies
Martin, Lisa, PhD, University of Michigan, Associate Professor Women’s and Gender Studies
Roddy, Juliette, PhD, Wayne State University, Professor Criminology and Criminal Justice
Shelton, Donald, JD, PhD, University of Nevada, Associate Professor Criminology and Criminal Justice and Sociology

Department of Behavioral Science
Aronson, Pamela, PhD, University of Minnesota, Professor Sociology
Banner, Francine, JD, PhD, Arizona State University, Associate Professor Sociology
Beauchesne, Patrick, PhD, University of California at Berkeley, Assistant Professor Anthropology
Brainer, Amy, PhD, University of Illinois at Chicago, Assistant Professor Women’s and Gender Studies and Sociology
Chatkoff, David, PhD, University of Southern Mississippi, Associate Professor Psychology
Chenoweth, John, PhD, University of California Berkeley, Assistant Professor Anthropology
Clark-Foos, Arlo, PhD, University of Georgia, Assistant Professor Psychology
Dolins, Francine, PhD, University of Stirling (Scotland), Assistant Professor Psychology
Draus, Paul, PhD, Loyola University, Professor Sociology
Early, Kevin, PhD, University of Florida, Associate Professor Sociology
Forsythe-Brown, Ivy, PhD, University of Maryland, Assistant Professor Sociology
Hymes, Robert W, PhD, Michigan State University, Associate Professor
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Lacey, Krim, PhD, Wayne State University, Assistant Professor African and
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Leonard, Michelle, PhD, Wayne State University, Assistant Professor
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Liu, ZhongXu, PhD, University of Toronto, Assistant Professor Psychology
Loeb, Roger C., PhD, Cornell University, Professor Psychology
McAuslan, Pamela, PhD, Wayne State University, Associate Professor
Psychology
McKenna, Brian, PhD, Michigan State University, Associate Professor
Anthropology
Patel, Nehal, JD, PhD, Northwestern University, Associate Professor
Criminal Justice and Sociology
Pecina, Susana, PhD, University of Michigan, Associate Professor
Psychology
Price, Carmel, PhD, University of Tennessee at Knoxville, Assistant
Professor Psychology
Reppond, Harmony, PhD, University of California at Santa Cruz, Assistant
Professor Psychology
Sethuraman, Nitya, PhD, University of California at San Diego, Assistant
Professor Psychology
Shelton, Donald, JD, PhD, University of Nevada, Associate Professor
Sociology
Siebert, Caleb, PhD, Adelphi University, Assistant Professor Psychology
Straub, Richard O., PhD, Columbia University, Professor Psychology
Swift, Dan J., PhD, University of New Hampshire, Associate Professor
Psychology
Waung, Marie, PhD, Ohio State University, Professor Psychology
Wellman, Rose, PhD, University of Virginia, Assistant Professor
Anthropology
Whitehead, Brenda, PhD, University of Notre Dame, Associate Professor
Psychology
Wrobel, Nancy, PhD, Wayne State University, Professor Psychology

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DeGenaro, William, PhD, University of Arizona, Professor Composition and
Rhetoric
Dika, Rifaat, PhD, Wayne State University, Lecturer IV Arabic
Elmeligi, Wessam, PhD, Alexandria University (Egypt), Assistant Professor
Arabic
Gilmore, H James, MA, University of Iowa, Clinical Associate Professor
Communication
González del Pozo, Jorge, PhD, University of Kentucky, Professor Spanish
Iannarino, Nicholas, PhD, University of Kentucky, Assistant Professor
Communication
Kiska, Timothy, MA, Wayne State University, Associate Professor
Communication
Lee, Jamie, PhD, University of Illinois, Associate Professor Linguistics
Luckett, Anthony, MA, Wayne State University, Lecturer III Film Studies
Luthra, Rashmi, PhD, University of Wisconsin-Madison, Professor
Communication
MacDonald, Michael Tyler, PhD, University of Wisconsin - Milwaukee,
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Mannion, Jerilyn, MA, Bowling Green State University, Lecturer IV French
Martinez-Valencia, Francia Eliana, PhD, University of Alabama, Associate
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McMillan, Liana, MA, University of Michigan, Lecturer III German
Murphy, Troy, PhD, University of Pittsburgh, Associate Professor
Communication
Murray, Margaret, PhD, University of Colorado - Boulder, Assistant
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Petrak, Samantha, MA, Bowling Green State University, Lecturer IV
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Potvin, Phillip, MFA, Bennington College, Lecturer IV Composition and
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Proctor, Jennifer, MFA, University of Iowa, Associate Professor
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Rodríguez-McGill, Carlos, PhD, Ohio State University, Associate Professor
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Scarlatta, Gabriella M., PhD, Wayne State University, Professor French
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and Rhetoric
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Abou-Zeineddine, Ghassan, PhD, University of Wisconsin - Milwaukee,
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Aljaz, Imran, PhD, University of Auckland (New Zealand), Associate
Professor Philosophy
Bond, Erik, PhD, New York University, Associate Professor English
Literature
Erickson, Susan N., PhD, University of Minnesota, Professor Art History
Finlayson, J. Caitlin., PhD, University of Toronto, Associate Professor
English Literature
Hughes, Paul, PhD, University of Illinois-Chicago, Professor Philosophy
Jarenski, Michelle, PhD, Loyola University Chicago, Associate Professor
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Kirkland, Joseph, JD, University of Michigan Law School, Lecturer III
Philosophy
Linker, Maureen, PhD, City University of New York, Professor Philosophy
Little, Daniel, PhD, Harvard University, Professor Philosophy
Nesbitt, Sarah, MFA, Pennsylvania State University, Lecturer III Art History
Ng, Diana, PhD, University of Michigan, Associate Professor Art History
Rottner, Nadja, PhD, Columbia University, Associate Professor Art History
Smith, Jonathan, PhD, Columbia University, William E Stirton Professor Professor, English Literature, and Behavioral Sciences
Smith Pollard, Deborah, PhD, Michigan State University, Professor English Literature and Humanities
Stojkovski, Velimir, PhD, Marquette University, Assistant Professor Philosophy
Yeakel, Daniel, PhD, Wayne State University, Lecturer III Philosophy

**Department of Mathematics and Statistics**
Agarwal, Mahesh, PhD, University of Michigan, Associate Professor Mathematics
Cengiz-Phillips, Nesrin, PhD, Western Michigan University, Associate Professor Mathematics Education
Clifford, John H., PhD, Michigan State University, Professor Mathematics
Dabkowski, Michael, PhD, University of Wisconsin, Assistant Professor Mathematics
Fiore, Thomas, PhD, University of Michigan, Associate Professor Mathematics
Georgieva-Hristova, Yulia, PhD, Texas A & M University, Associate Professor Mathematics
Jabbusch, Kelly, PhD, University of Washington, Associate Professor Mathematics
Kim, Hyejin, PhD, University of Maryland College Park, Associate Professor Mathematics
Krebs, Angela, PhD, Michigan State University, Associate Professor Mathematics Education and Mathematics
Lachance, Michael A., PhD, University of South Florida, Professor Mathematics
Li, Gengxin, PhD, Michigan State University, Associate Professor Statistics
Macany, Montaha, PhD, University of Manchester (England), Lecturer Mathematics
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Phillips, Benjamin, PhD, Western Michigan University, Lecturer Mathematics
Pokhrel, Keshav, PhD, University of South Florida, Assistant Professor Statistics
Radosevich, Mark R., PhD, Brandeis University, Lecturer Mathematics
Rathouz, Margaret, PhD, University of California-San Diego, Associate Professor Mathematics Education
Remski, Joan, PhD, Michigan State University, Professor Mathematics
Sharaf, Taysseer, PhD, University of South Florida, Assistant Professor Statistics
Viswanathan, Aditya, PhD, Arizona State University, Assistant Professor Mathematics
Wiggins, Alan, PhD, Texas A&M University, Associate Professor Mathematics
Zeytuncu, Yunus, PhD, Ohio State University, Associate Professor Mathematics
Zhao, Jennifer, PhD, Indiana University, Professor Mathematics

**Department of Natural Science**
Abramyan, John, PhD, University of Queensland (Australia), Assistant Professor Biology
Al-Qaisi, Sami, PhD, University of Akron, Lecturer Chemistry
Alteri, Christopher, PhD, University of Arizona College of Medicine, Assistant Professor Biology and Microbiology
Bandyopadhyay, Krisanu, PhD, National Chemical Lab University of Pune (India), Professor Chemistry
Bazzi, Ali, PhD, Wayne State University, Professor Chemistry
Bazzi, Judith, MA, Wayne State University, Lecturer Chemistry
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Bianchette, Thomas, PhD, Louisiana State University, Lecturer III Geology
Bowlin, Melissa, PhD, Princeton University, Associate Professor Biology
Clarkson, William I., PhD, University of Southampton (UK), Associate Professor Physics and Astronomy
Constantinides, Christos, PhD, University of Cambridge, Assistant Professor Chemistry
Danielson-Francois, Anne, PhD, University of Arizona, Associate Professor Biology
Deng, Yiwei, PhD, Swiss Federal Institute of Technology, Professor Chemistry
Donahue, Craig J., PhD, University of Massachusetts, Associate Professor Chemistry
Gelderloos, Orin G., PhD, Northwestern University, Professor Biology and Environmental Studies
Hartshorn, Patricia, MS, Wayne State University, Lecturer IV Natural Sciences
Heinicke, Matthew, PhD, Pennsylvania State University, Associate Professor Biology
Hetrick, James, PhD, University of Illinois at Urbana-Champaign, Lecturer IV Physics
Kamp, Ulrich, PhD, Technische University Berlin, Professor Earth and Environment
Kondapalli, Kalyan, PhD, Wayne State University, Assistant Professor Biology
LaComare, Katherine S., PhD, University of Massachusetts, Lecturer III Biology
Lawson, Daniel, PhD, Michigan State University, Associate Professor Chemistry
Li, Xiaohua (Shannon), PhD, City University of New York, Associate Professor Chemistry
Licata, Nicolas, PhD, University of Michigan, Associate Professor Physics
COMP 105

Depending on score on the Placement Exam, most students take COMP 105 and COMP 106 (Writing & Rhetoric I & II). Engineering students substitute COMP 270 (Technical Writing for Engineers) for COMP 106, taking the course during the second semester of their sophomore year.
students take COMP 280 (Business Writing & Rhetoric) in place of COMP 106.

Each entering student should make every effort to complete the composition sequence during his or her first year on campus, since it is designed to acquaint students with expectations and strategies of university writing. Placement in the appropriate introductory course is determined by the Composition Placement Examination. No student may enroll in an introductory composition course before taking the Composition Placement Examination.

Students who place into COMP 099 must first pass COMP 099, which carries additive degree credit, with a grade of C- or better before enrolling in COMP 105. Transfer students who score below the COMP 105 level will be required to take COMP 227 (which carries degree credit) even if their previous writing courses have been accepted for transfer credit. Students who did not take the Placement Examination during the orientation session should contact the Orientation Office or Writing Program Office to schedule an examination. Students may submit a portfolio of written work to appeal a placement decision, but no degree credit is given for courses exempted via portfolio. Appeals must be submitted by the end of the last week of classes in the first semester a student is enrolled. Any student who has not taken the English Placement Exam prior to the sixth week of their first enrolled semester will be given 8 weeks from their exam date to submit an appeal.

Students in the Honors Program fulfill their six-hour composition requirement by taking COMP 110 and COMP 220 (Honors Writing & Rhetoric I & II). Transfer students admitted with credit in composition from other institutions of higher education will be placed in an appropriate composition course based on their transfer credit and performance on the Composition Placement Examination, as determined by the Director of the Writing Program. Only courses judged equivalent to COMP 105 and COMP 106 may be substituted for the required courses. Students are urged to take their composition courses at UM-Dearborn. UM-Dearborn does not accept hours earned in composition through placement examinations at other universities.

For more information, see the Writing Program website.

**First Year Seminars**

First Year Seminars are special classes designed for entering first-year students to ease the transition from high school to college. These are small, welcoming classes developed by dedicated UM-Dearborn faculty who have made a special commitment to helping students master important college skills. In a First Year Seminar, students find it much easier to get acquainted with college life and explore the university’s academic resources.

Each First Year Seminar benefits new students in the following ways:

- Exposure to exciting ideas on a special topic
- Special attention to college-level reading, writing, discussion and research skills
- Extra-curricular activities and opportunities, such as field trips, tours and projects
- Extra mentoring and support
- Creating a sense of community and easing the social transition of students to UM-Dearborn

A few of the many seminar topics that have been developed include the following:

- “Car Culture”: the history of the automobile in American life and imagination
- “Fast Food Nation”: a look at the fast food industry through various lenses (economics, anthropology, sociology, environmental studies, politics, history and more)
- “To Infinity and Beyond”: an exploration of the concept of infinity using very creative learning techniques
- “Shakespeare on Stage, Page, & Screen”: this seminar incorporates films, texts and a trip to the Shakespeare Festival in Stratford, Ontario, to explore variations on Shakespeare plays based on different media, cultural contexts, and different artistic and ideological agendas.
- “Bad Decisions and Why We Love Them”: This course is based on a popular book by a Nobel-prize winning psychologist that shows how we can recognize common fallacies, to which we are all susceptible, and so improve our understanding of the way we think.

Some seminars are linked with a Composition class, allowing students to meet a Dearborn Discovery Core (DDC) Written and Oral Communication (GEWD) requirement and take two classes with the same group of people. The seminars will also meet other DDC requirements.

**Cooperative Education Program**

Cooperative Education in CASL is an academic program founded on UM-Dearborn’s commitment to "excellence in teaching and learning." It promotes liberal arts learning and career/personal development through student participation in paid, professional employment. Expected learning outcomes include clarification of values, development of problem-solving and career-related skills, and enhancement of academic knowledge.

Students work one or more terms in part-time or full-time positions paying $9-20.00/hour. They also earn upper-level academic credit for their co-op experiences. To be eligible for the co-op program, students must be admitted to an undergraduate major in the college and must have completed 30 credit hours with a minimum 2.25 GPA. Transfer students must complete 12 credit hours at UM-Dearborn before they are eligible.

Students may earn a maximum of 10 S/E credit hours through co-op work assignments of one to three credit hours. Students should be aware that applying for co-op does not guarantee job placement. Liberal arts students are advised to use curriculum electives to acquire the technical skills needed to improve their marketability and to avail themselves of career counseling available through the Office of Career Services.

Students compete for open co-op positions offered by area employers. After being hired by a co-op employer, students register for co-op and are required to submit academic learning objectives and a critical evaluation essay for approval by the co-op faculty, who determines the awarding of credit. The Co-op Office reviews requests for student arranged co-ops. Contact the Co-op Office in Room 285 FCN, 313-593-5188, for more information.

**Internships and Field Experiences**

In addition to the paid work experience offered in the cooperative education program, non-paying off-campus educational opportunities for academic credit are offered by various departments in the College. For specifics, see the course description for each discipline’s offering.

**Criminology and Criminal Justice Internship**

Criminology and Criminal Justice internships are designed to provide field experience for Criminal Justice majors. Actual field experience will provide students with valuable tools to help them achieve their goals and produce humane leaders with the technical skills and social
and ethical sensitivity needed to succeed in their chosen field. The internship has a seminar component. The seminar helps students make informed decisions relative to their future career in Law Enforcement or Criminal Justice related fields. Both the internship and seminar provide opportunities for students to personalize their learning experience. Students are supervised by a faculty advisor.

For more information about the Criminology and Criminal Justice internship, contact the Internship Coordinator (313) 583-6404; email: criminal_justice@umd.umich.edu

**Economics Internship**
The economics internship offers students field experiences with businesses, non-profit organizations and government agencies. The placement allows students to get hands-on experience applying the tools of economic analysis to specific job and project assignments. Student interns spend either eight or 16 hours per week in unpaid work at their placement site, for which they earn either three or six academic credits. Only three credit hours may be used to satisfy the concentration requirements in economics. All interns are assigned to an economics faculty advisor. This program is open to all declared economics majors, who, by the start of the internship, have completed at least two upper-level economics courses in addition to two of the following core courses: ECON 301, ECON 302 and ECON 305. Permission of the Internship Coordinator is required. To inquire, call the Economics Internship Faculty Coordinator in the Department of Social Sciences at 313-593-5164.

**Environmental Studies Internship**
The environmental studies internship, which is required of all environmental studies concentrations, involves students in a wide variety of positions with government organizations (Department of Environmental Quality, departments of health, city and county agencies), consulting firms, and non-governmental organizations as field assistants and researchers. Students work a prescribed number of hours per week as arranged by the advisor and employer, typically earning three credit hours. Written permission of instructor is required to participate. To inquire, contact the Department of Natural Sciences at 313-593-5339.

**History and Humanities Internship**
The history and humanities internship offers practical experience to students in art history, communication, English, foreign languages, history, humanities, music, and philosophy. Students develop job-entry experiences in humanities and history-related careers. The internship includes a required seminar. Although, in general, the internship is offered for elective credit, it may be used to satisfy the following concentration requirements: Three credit hours may be applied towards a Communication major/minor or toward an Art History/Museum Studies degree and six credit hours may be applied towards a Journalism concentration. For students with a foreign language focus, three credit hours may be used within the International Studies Support Studies component or toward the cognate requirement of the French or Hispanic Studies concentrations. Prerequisites are junior or senior standing.

Students earn three to six credit hours per semester. The maximum total credit hours are 12. To inquire, contact the History/Humanities Internship Office, 3028 CB, 313-583-6376.

**Psychology Internship**
Psychology internship placements offer work experiences in a wide variety of human services organizations. These include programs related to child abuse, criminal rehabilitation, crisis intervention, geriatrics, human resources, mental illness, organizational development, special education, substance abuse, and women's issues. Students spend six or 12 hours per week at their field placement and attend a weekly seminar involving training in listening and helping skills. Students may register for three or six credits. Prerequisites are PSYC 101 and permission of instructor. To inquire, contact the Department of Behavioral Sciences at 313-593-5520.

**Public Affairs Internship**
The public affairs internship program allows students to participate in the political process through placements in a variety of governmental offices. Students in the local internship program work for state and local elected officials, law firms, and interest groups. Students in the Washington, D.C. program have worked in the White House, the Pentagon, and for Members of Congress. Students in the Ottawa, Canada program work in a Member of Parliament’s office for a period of five weeks. Admission is reserved primarily for qualified juniors and seniors of all majors. Six upper-level credits are granted for successful completion of either program. Scholarships are available. To inquire, contact the Department of Social Sciences at 313-593-5164.

**Sociology/Social Work Internship**
The sociology/social work internship offers students the opportunity to work in social welfare agencies and/or human services organizations such as domestic violence shelters, criminal justice agencies, head start programs, substance abuse rehabilitation, gerontology, hospice, human resources, health care, urban planning, and so on. The emphasis in the field experience is on the social problems that bring clients to agencies and on the social contexts within which agencies deliver services.

Students spend six to eight hours per week on site and two hours in a classroom seminar. Prerequisite is SOC 200 and permission of instructor. Students may enroll for three to six credit hours. To inquire, contact the Department of Behavioral Sciences at 313-593-5520.

**Women's and Gender Studies Internship**
The WGST internship offers students an opportunity to work in a variety of fields that address gender inequities and/or serve the needs of women and girls. These include, but are not limited to, adolescent services, domestic violence shelters, legal clinics, human resources, health care settings, advocacy organizations, and residential counseling settings. Students spent six to eight hours per week on-site and two hours in a classroom seminar. Prerequisites are WGST 303 or permission of instructor. To inquire, contact the WGST office, 2040 CB, 313-593-1391.

**Women in Learning and Leadership (WILL)**
The Women in Learning and Leadership (WILL) Program is an integral part of the Women's and Gender Studies Program's commitment to fostering student engagement on campus and in the greater Detroit area.

WILL is a program for undergraduate students that integrates Women's and Gender Studies curriculum with leadership opportunities outside of the classroom.

WILL is part of a national set of programs devoted to fostering, developing, and supporting collegiate women's leadership. It is a co-curricular program founded on three core principles:

- Required women's and gender studies-related coursework
- A student-run leadership development organization
- Women's and gender-related programming outside of the classroom

The following are the main goals of the program:
• To encourage critical thinking and intellectual curiosity by providing active learning opportunities that empower students as leaders during and beyond their college years
• To foster a deeper understanding of women’s diverse roles and contributions to society
• To increase awareness of obstacles created by gender, racial, and social class stratification and develop individual and collective strategies to address these obstacles
• To enrich the campus, Metro Detroit, and global community through service and programming.

Requirements for WILL
Students accepted into WILL complete 4 courses in Women’s and Gender Studies and an internship or co-op experience in a field of their choice. There are two required courses for the program: Introduction to Women’s and Gender Studies, and a Women, Leadership and Social Change class. For their two electives, students may choose from the wide variety of courses offered by the Women’s and Gender Studies program. In addition to fulfilling these curricular requirements, WILL students spend a minimum of 15 hours per semester engaged in co-curricular activities related to gender equity and community building. Among their other activities, the WILL student group engages in volunteer opportunities with social service agencies in metropolitan Detroit. In addition, they have the opportunity to meet with locally and nationally known gender equity leaders for casual “fireside chats” and are offered annual training seminars by local women leaders. They organize speaker and film series on topics such as leadership for global gender justice, eating disorders and body image, and violence awareness on campus. They also run an innovative and successful mentoring program for middle school girls in Southwest Detroit. WILL students’ internship placements have allowed them to work with women in the criminal justice system, in programs for at-risk youth, in an oral history project interviewing Arab-American women, and in a variety of positions in legal, medical, business and education fields with women leaders as mentors.

The program recruits in April every academic year for acceptance into the program the following Fall term. Students accepted into the program have a minimum of a 3.0 grade point average, demonstrated leadership ability, and an interest in fostering gender equity.

For more information, please visit the WILL webpage.

CASL Online and Blended Courses
Regular credit-bearing courses are offered via online and blended formats to UM-Dearborn students (and guest students) who can benefit from the flexibility and convenience of online course delivery. Students who want to pursue a university education but have special constraints such as job demands, childcare or eldercare responsibilities, pregnancy or medical limitations may also find that online learning helps them stay on track. Online learning classes are taught by UM-Dearborn’s distinguished faculty and are equivalent in academic depth and rigor to face-to-face versions taught in the traditional classroom. New courses are added to the online repertoire each year. A few courses are in blended format; that is, the classes meet on campus for one or two class periods and online for the remainder.

Regularly enrolled students may elect online learning courses as part of the registration process. Guest students must submit the Michigan Uniform Guest Application, available in our Admissions/Registrar’s offices or in the Registrar’s office of the student’s home institution, and complete the admissions process before registering for classes.

Online courses usually require regular participation in online discussion groups established for the class. Required materials may be made available in various formats, including conventional textbooks and online resources, including video and/or audio recordings. Some online courses may require attendance on campus at an orientation session and/or for exams, though special proctoring arrangements can be made, especially for non-local students.

Canvas is the home for all online courses, as well as some assignments, discussions, and resources for hybrid and on-campus classes. This Canvas portal page will provide you with up-to-date Canvas policies, help & support (https://umdearborn.edu/canvas/canvas-help-support/), and other more specific information for faculty and students.

The Digital Education office is located in 1100 Social Sciences Building, email umd-digitaleducation@umich.edu

Japan Center for Michigan Universities
Since 1989, the fifteen Michigan public universities have operated a unique program in Japanese language and culture in our sister state in Japan, the Shiga prefecture. The Japan Center for Michigan Universities is in Hikone, a beautiful, medium-sized, non-westernized city in central Japan. The $15 million facility, built by the Shiga government, includes classrooms, offices, and apartments with cooking facilities for student occupancy; home stays, of varying duration, may also be arranged. The full academic program runs from September through the end of April; students may also select a one-semester program, or the Summer Intensive Program in the Japanese language. UM-Dearborn students receive 26 hours of credit for UM-Dearborn courses in Japanese language (see course descriptions under Japanese in this Catalog for the following: JPN 128-JPN 129, JPN 178-JPN 225, or JPN 228-JPN 229), Japanese Culture and Society (JPN 395, JPN 396), and two other courses taught by visiting professors. These have included Japanese art and painting, Japanese technology and business, energy and environment in Japan, modern Japanese history, and mass media.

For current information on program fees and housing, visit the Japan Center for Michigan Universities website. Applicants need not know Japanese, but they should have studied another foreign language and have had some foreign travel experience. They must have sophomore standing by the end of Winter term and a 2.5 or higher GPA. Students should contact the: Office of International Affairs (Room 108 in The Union at Dearborn) for additional information.

Study Abroad
Students interested in other study abroad programs should consult faculty in Modern and Classical Languages, their major advisor, or the Office of International Affairs (Room 108 in The Union at Dearborn) for additional information.

Special Centers, Facilities and Services

CASL Advising and Academic Success
The CASL Advising and Academic Success office helps students make informed decisions about their course of study and the liberal arts. CASL advisors are available to provide curricular and career option information, program requirements, University policies and procedures, and campus resources. The office also coordinates academic advising between students and faculty mentors, provides necessary College forms and materials, and reviews students’ academic progress and performance at specified intervals.
The CASL Advising and Academic Success office contact information: 1039 CB, 313-593-5293, and online at casladvising@umich.edu.

University of Michigan-Dearborn Writing Center
The University Writing Center, staffed by experienced student peer consultants under the supervision of full-time faculty in composition, provides support for all UM-Dearborn students wishing to improve their writing. Students needing regular one-on-one help in developing basic writing skills, as well as more advanced students wishing to improve their writing, will find the Writing Center useful.

The Writing Center is open five days a week during Fall and Winter terms and on a more limited basis during the summer term. It is strongly recommended that students make an appointment should they wish to work with a peer consultant. The center is equipped with personal computers and software for student use including word processing software, grammar programs and Internet access and research. For further information, contact the Writing Program Office, 3018 CB, or telephone 313-593-5238.

The center is located in 3035 CB with smaller satellite locations around campus. The center tries to accommodate walk-ins but prefers students make appointments online at umdearborn.edu/casl/writ_center.

Center for Arab American Studies
The Center for Arab American Studies focuses on scholarship, research, and engagement with the Arab-American community in Dearborn and Metropolitan Detroit. Faculty in Arab American Studies are actively engaged in research and scholarship on current issues facing Arab Americans as well as Arab American history and culture. As teachers, they seek to help all students understand the role of Arabs in American society, the role of America in Arab society, and the vibrant interplay between them. For additional information contact the Center in Room 2040 CB or call 313-593-4925.

Center for Armenian Research
The Armenian Research Center (ARC) was established for the documentation and the publication of materials in the field of Armenian studies and affairs. The ARC accomplishes this work in a variety of ways. It provides access to a computerized database of books, periodical articles, audiovisual material, and other items concerning Armenians. This database is gradually also becoming accessible through the on line catalog of the Mardigian Library. The ARC also regularly publishes scholarly books on Armenian topics. It supports both academic and public outreach by participating in forums, sponsoring conferences, exhibitions, public lectures and answering questions from scholars, students and the public media. Finally, the ARC sponsors and supports the teaching of Armenian language instruction courses on the University of Michigan, Dearborn campus. For additional information call 313-593-5181.

Center for Mathematics Education
The Center for Mathematics Education is dedicated to improving the quality of teacher preparation for prospective teachers and to making continuous professional development available for current teachers. The goal is to strengthen the teaching of mathematics and improve student learning. The professional development programs offered by the Center seek to deepen teachers’ understanding of the mathematics they teach and emphasize best teaching practices through the study and use of current research and standards-based curriculum resources. These professional development activities are offered at school district sites and at regional intermediate school districts, and carry at least 3 SB-CEU credits. It is also possible for classroom teachers to enroll for graduate credit. These credits can be applied towards the degree requirements for the Specialty in Middle Grades Mathematics program that is part of the College of Education, Health, and Human Services’ Master of Arts in Education degree. For additional information see the Center for Mathematics Education website.

Center for Ethnic and Religious Studies
In 2001, faculty in the College of Arts, Sciences, and Letters at the University of Michigan-Dearborn established a Center for the Study of Religion and Society.

This innovative and unique Center was designed to serve a number of purposes:

- Provide a focus for interdisciplinary and multidisciplinary scholarly research on Religion and its relationship to American society.
- House and support the existing interdisciplinary minor in Religious Studies.
- Coordinate with other activities on campus related to religion, the Harvard Pluralism Project being one example.
- Serve as a point of contact for members of the metropolitan community interested in issues related to religion and to engage that community in a dialogue about those issues.

Faculty affiliated with the Center and the Religious Studies minor come from a range of disciplines including History, Anthropology, English, Political Science, Psychology, and Philosophy. Many are actively involved in research and outreach with religious communities in Dearborn and Metropolitan Detroit.

For more information, please see the Center website or call 313-583-6335.

Mathematics Learning Center (MLC)
The Department of Mathematics and Statistics supports a peer tutoring program for UM-Dearborn students needing assistance with their work in college algebra, pre-calculus, calculus, differential equations, linear algebra, statistics, and mathematics education courses. Peer tutors, who are carefully vetted, trained, and supervised by the Director of the Center, are available during posted hours throughout the week. Computer tutorials and videos are also available to assist students in their preparation for the Mathematics Placement Exam and in certain mathematics courses. Please call 313-583-6351 or visit the MCL website for a current list of programs available for student support. The MLC is located in Room 2076 CB. The department provides auxiliary tutorial support for developmental algebra courses (MATH 080 and MATH 090). Instructors for these courses will have information for students regarding the tutoring hours and location at the beginning of each semester.

Science Learning Center
The Department of Natural Sciences operates a Science Learning Center (SLC) for students enrolled in a variety of science courses. The SLC program ensures that all science students have adequate preparation for high achievement in science by providing self-paced, individualized instruction in essential mathematical, conceptual, and laboratory skills. Instructional modules are presented in one of several formats, including printed material and digital or multimedia tutorials that may be accompanied by specific laboratory instruments. All instructional modules are available online at the SLC (https://umdearborn.edu/casl/undergraduate-programs/academic-support/science-learning-center/) website. Mastery of the subject matter is assessed by a short post
Actuarial Mathematics

Actuarial Mathematics is an interdisciplinary subject that straddles business, economics, mathematics, and statistics. In a single phrase its focus is on the management of risk. The curriculum of this program is designed to support students in becoming an Associate of the Society of Actuaries (SOA). Three of these requirements are pairs of courses that satisfy the Validation by Educational Experience (VEE) requirement of the Society. The balance of the coursework is in support of passing the SOA’s exams: Probability, Financial Mathematics, and Investment & Financial Markets.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

- Ancient Greek I and II: MCL 105 and MCL 106
- Arabic I and II: ARBC 101 and ARBC 102
- Armenian I and II: MCL 111 and MCL 112
- Chinese I and II: CHIN 101 and CHIN 102
- French I and II: FREN 101 and FREN 102
- German I and II: GER 101 and GER 102
- Latin I and II: LAT 101 and LAT 102
- Spanish I and II: SPAN 101 and SPAN 102

Pre-Major Requirements

Not counted in the 37 credit hours required for the major.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
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<tr>
<td>CIS 1501</td>
<td>CS I for Data Scientists</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
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</table>

Major Requirements

37 credit hours upper level.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 325</td>
<td>Probability</td>
<td>12</td>
</tr>
<tr>
<td>MATH 335</td>
<td>Mathematics of Interest Theory</td>
<td></td>
</tr>
<tr>
<td>MATH 425</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 435</td>
<td>Mathematics of Finance</td>
<td></td>
</tr>
<tr>
<td>STAT 305</td>
<td>Intro. to Data Science</td>
<td>13</td>
</tr>
</tbody>
</table>
throughout the Diaspora for greater human rights and a higher quality of
knowledge of the struggles of Africans and African descendants.
Political leaders, intellectuals and artists will have a grasp of the critical movements for change in African and
African civilization and the cultures of Africans in the Diaspora. Students
United States, as well as an understanding of the continuities between
knowledge of essential aspects of the African American experience in the
program housed in the College of Arts, Sciences and Letters at the
African and African American Studies (AAAS) is an interdisciplinary
program. Many of the courses offered in the African and African American Studies
Program are cross listed with other disciplines, such as Anthropology, Communications, Economics, English, History, Music History, Psychology and Sociology.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits
any approved course to satisfy up to three credit hours within three
different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)
Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)
Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)
Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
• Lecture/Lab Science Course
• Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)
Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)
Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

African and African American Studies
African and African American Studies (AAAS) is an interdisciplinary
program housed in the College of Arts, Sciences and Letters at the
University of Michigan-Dearborn. The AAAS major offers students a broad
knowledge of essential aspects of the African American experience in the
United States, as well as an understanding of the continuities between
African civilization and the cultures of Africans in the Diaspora. Students
will have a grasp of the critical movements for change in African and
African American history, as well as the contributions of outstanding
political leaders, intellectuals and artists.

Knowledge of the struggles of Africans and African descendants
throughout the Diaspora for greater human rights and a higher quality of
life will be a central feature of the major. These pedagogical objectives
will be facilitated by a commitment to interdisciplinary scholarship and
approaches that emphasize the value of an internationalist perspective.

In addition, students will master research and writing competence. They
will have the opportunity to undertake independent research projects
under the direction of faculty members. It is hoped that such projects
will be tied to critical social issues facing the Metropolitan Detroit
community or communities in the wider African diaspora.

Notes:
1. At least 18 of the 37 upper level credit hours must be elected at UM-Dearborn.
2. Students are strongly recommended to complete at least one
   Experiential Education experience, co-op or internship before
   graduation.
3. Students wishing to use graduate level courses (STAT 500+, MATH
   500+) as part of the 34 hours required for the major must submit a
   petition to obtain the approval of the Actuarial Studies faculty advisor
   prior to registering for the class.
4. Students not enrolled in the College of Business BBA Program cannot
   elect more than 30 upper-level (courses numbered 300 and above)
   credit hours offered by the College of Business.
5. A minimum 2.0 GPA in the major is required for graduation.

| STAT 325  | Applied Statistics I |
| STAT 430  | Applied Regression Analysis |
| STAT 450  | Multivariate Stat Analysis |

Finance Core
| FIN 401  | Corporate Finance |
| FIN 402  | Advanced Corporate Finance |

Electives
Choose two
| ECON 302  | Intermediate Microeconomics |
| ECON 305  | Economic Statistics |
| ECON 355  | Health Economics |
| ECON 438  | Beh Econ for Business & Policy |
| ECON 4015 | Introduction to Econometrics |
| FIN 407   | Investment Fundamentals |
| FIN 411   | Financial Planning |
| FIN 412   | Retirement Planning |
| FIN 447   | Derivative Markets |
| MATH 420  | Stochastic Processes |
| MATH 451  | Advanced Calculus I |
| MATH 452  | Advanced Calculus II |
| MATH 472  | Intro to Numerical Analysis |
| MATH 473  | Matrix Computation |
| MKT 352   | Mktg Principles and Policies |
| OB 354    | Behavior in Organization |
| STAT 460  | Time Series Analysis |

Total Credit Hours 37
Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

- Ancient Greek I and II: MCL 105 and MCL 106
- Arabic I and II: ARBC 101 and ARBC 102
- Armenian I and II: MCL 111 and MCL 112
- Chinese I and II: CHIN 101 and CHIN 102
- French I and II: FREN 101 and FREN 102
- German I and II: GER 101 and GER 102
- Latin I and II: LAT 101 and LAT 102
- Spanish I and II: SPAN 101 and SPAN 102

Major Requirements
30 hrs (24 hrs must be upper level):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>AAAS 300</td>
<td>Introduction to AAAS</td>
<td>3</td>
</tr>
<tr>
<td>AAAS/HIST 345</td>
<td>West Africa Since 1800</td>
<td>3</td>
</tr>
<tr>
<td>AAAS/ANTH 371</td>
<td>African Exper in the Americas</td>
<td>3</td>
</tr>
<tr>
<td>AAAS/ENGL/LING 477</td>
<td>African American English</td>
<td>3</td>
</tr>
</tbody>
</table>

African American History (17th-19th Centuries)
Select 3 credit hours from the following:

- AAAS/HIST 316 | African American History                           | 3            |
- AAAS/HIST 368 | Black Exp in US: 1865-Present                      | 3            |

Contemporary African American History
Select 3 credit hours from the following:

- AAAS/HUM/HIST/SOC 304 | Detroit History and Culture                        | 3            |
- AAAS/CRJ/PSYC 322 | Psychology of Prejudice                             | 3            |
- AAAS/HIST 369 | Civil Rights Movement in Amer                       | 3            |
- AAAS/CRJ/SOC 403 | Minority Groups                                     | 3            |
- AAAS/CRJ/SOC 473 | Race, Crime, and Justice                            | 3            |

African American Intellectual History
Select 3 credit hours from the following:

- AAAS/ANTH/STS 340 | Race and Evolution                                  | 3            |
- AAAS/HIST 3640 | Black Intellectual History                          | 3            |

Literature, Visual and Performing Arts
Select 3 credit hours from the following:

- AAAS/ENGL 239 | Intro to Lit: African American                      | 3            |
- AAAS 320 | African-American Music History                       | 3            |
- AAAS 333/HUM 333/RELS 333 | Intro to Gospel Music                               | 3            |
- AAAS/HUM/JASS 385 | Black Cinema                                       | 3            |
- AAAS/HUM/MHIS 388 | W. African Music: Trad.&Glob.                        | 3            |
- AAAS/ENGL 469 | Contemporary African Amer Lit                        | 3            |
- AAAS 470/ENGL 4705/HUM 4705/WGST 470 | Black Women / Lit, Film, Music                      | 3            |
- AAAS 470/ENGL 4705/HUM 4705/WGST 470 | Black Women / Lit, Film, Music                      | 3            |
- AAAS/HUM/MHIS 120 | History of Jazz                                      | 3            |

African American Institutions
Select 3 credit hours from the following:

- AAAS/HUM/HIST/SOC 304 | Detroit History and Culture                        | 3            |
- AAAS/RELS 313 | African American Religions                          | 3            |
- AAAS/HIST/RELS 3634 | History of Islam in the US                          | 3            |
- AAAS/RELS 367 | Religion and Resistance                             | 3            |
- AAAS/ENGL 389 | Odyssey of Black Men in Amer                        | 3            |
- AAAS/RELS/WGST 393 | Black Women, Rel & Spirituality                    | 3            |
- AAAS/SOC 449 | Black Family in Contemp Amer                        | 3            |

Economics & Politics of the Black Experience
AAAS/HHS/SOC 433 | Race/Ethnic Health (other courses by Petition)      | 3            |

Research, Writing & Discourse in African/African American Studies
Must Petition – See Program Director

Independent Study Project or Thesis in Critical Contemporary Issues
Select 3 credit hours from the following:

- AAAS 498 | Thesis                                              | 3            |
- AAAS 499 | Independent Study                                   | 3            |

Total Credit Hours: 30

Notes: At least 15 of the upper level credit hours in the AAAS major must be elected at UM-Dearborn

Minor or Integrative Studies Concentration Requirements
To fulfill a minor or Integrative Studies concentration in African and African American Studies, a student must complete 15 credit hours of
coursework (6 credit hours must be exclusively African/African-American in content — CAGF) in the program as outlined below.

**Required courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAS 300</td>
<td>Introduction to AAAS</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select 12 hrs of 300/400; 3000/4000 level courses:</td>
<td>12</td>
</tr>
</tbody>
</table>

AAAS 300, introduces students to important issues and debates within African and African American Studies. The course will always incorporate both African and African-American themes; however, the emphasis may vary to reflect the specialties of the professor(s) at a given time.

Each term, AAAS offers a wide variety of 300/3000 and 400/4000 level courses that are designed to fulfill the core requirements of the AAAS minor or concentration. See the listing of AAAS course offerings below. Successful completion of the program requires that a student complete at least six of the required 15 credit hours in courses that are exclusively African and African-American in content (CAGF), (AAAS 316, AAAS 333, AAAS 345, AAAS 368, AAAS 371, AAAS 385, AAAS 389, AAAS 393, AAAS 449, AAAS 469, AAAS 470).

Students pursuing a minor or concentration in AAAS may choose to complete their coursework with a final thesis project (AAAS 498) that reflects particular interests developed during their course of study. The thesis option can be used to fulfill three hours of the required 15 hours of upper-level coursework. The AAAS thesis project will be completed under the direction of a faculty member whose scholarly interests are compatible with the research interests of the student.

For more information about the African and African American Studies program, please contact the CASL College Wide Programs Coordinator in 2040 CB, 313-593-4925.

The African & African American Studies Certificate is an interdisciplinary undergraduate and post-baccalaureate certificate that compliments the already existing minor and major concentrations of study in the AAAS program. As such, it too affords students an opportunity to gain “a working knowledge of the history of African Americans in the United States, the cultural continuities in philosophy, religion and the arts linking African Americans to the African continent as well as the critical social, political, and developmental issues facing African communities on the Continent and throughout the Diaspora.”

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>12 Credit hours required</td>
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</tr>
<tr>
<td></td>
<td>Required Course:</td>
<td>3</td>
</tr>
<tr>
<td>AAAS/HUM 300</td>
<td>Introduction to AAAS</td>
<td></td>
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<tr>
<td></td>
<td>Additional Courses - 9 credit hours required from:</td>
<td>9</td>
</tr>
<tr>
<td>AAAS/HIST 106</td>
<td>Intro to the African Past</td>
<td></td>
</tr>
<tr>
<td>AAAS/ENGL 239</td>
<td>Intro to Lit: African American</td>
<td></td>
</tr>
<tr>
<td>AAAS/HIST/ HUM/SOC 304</td>
<td>Detroit History and Culture</td>
<td></td>
</tr>
</tbody>
</table>

| AAAS/RELS 313 | African American Religions |
| AAAS/HIST 316 | African American History   |
| AAAS 320     | African-American Music History |
| AAAS/ ANTH 321/ HIST 3211 | Untold Caribbean: Field Course |
| AAAS/CRJ/ PSYC 322 | Psychology of Prejudice   |
| AAAS/ ECON 325/ WGST 326 | Econ of Poverty/Discrimination |
| AAAS 333/ HUM 3335/ MHIS 333/ RELS 333 | Intro to Gospel Music |
| AAAS/ANTH/ STS 340 | Race and Evolution |
| AAAS/HIST 345 | West Africa Since 1800    |
| AAAS/AAST/ HIST/RELS 3634 | History of Islam in the US |
| AAAS/RELS 367 | Religion and Resistance  |
| AAAS/HIST 368 | Black Exp in US: 1865-Present |
| AAAS/CRJ/ HIST 369 | Civil Rights Movement in Amer |
| AAAS/ANTH 371 | African Exp in the Americas |
| AAAS/HUM/ JASS 385 | Black Cinema |
| AAAS/ENGL 389 | Odyssey of Black Men in Amer |
| AAAS 390     | Topics in Af & Af Am Studies |
| AAAS/RELS/ WGST 393 | Black Women, Rel & Spirituality |
| AAAS/CRJ/ SOC 403 | Minority Groups |
| AAAS 404/ SOC 4045/ WGST 404 | Dissed: Differ, Power, Discrim |
| AAAS/HIST 4401 | Seminar: African Diaspora |
| AAAS/SOC 449 | Black Family in Contemp Amer |
| AAAS/ENGL 469 | Contemporary African Amer Lit |
| AAAS 470/ ENGL 4705/ HUM 4705/ WGST 470 | Black Women / Lit, Film, Music |
AAAS/CRJ/ SOC 473  Race, Crime, and Justice
AAAS/ENGL/ LING 477  African American English
AAAS 491  Topics in African Diaspora
AAAS 498  Thesis
AAAS 499  Independent Study

Total Credit Hours  12

NOTES REGARDING AAAS CERTIFICATE PROGRAM:

1. A minimum 2.0 cumulative GPA is required for admission to the program.
2. A maximum of one course may be taken as pass/fail.
3. A maximum of one transfer courses (three credit hours) may count toward the Certificate.
4. A maximum of 9 credits may share with the following majors: AAAS, BSCI, ENGL, HIST, PSYC, SOC, WGST.
5. Any AAAS related CASL internship may count in the certificate with permission of the AAAS program director by Petition.
6. A minimum 2.5 GPA in the courses counting toward the Certificate and a minimum 2.0 cumulative GPA are required at the time of graduation and/or posting of the certificate.

AAAS 106  Intro to the African Past  3 Credit Hours
This course is a survey of the social, economic, political, intellectual and cultural heritage of the African peoples from pre-history to the present. The emphasis is on the internal dynamics of the African society through five millennia, as well as the impact of external forces on African life. Themes of particular interest: the roots of African culture, the trans-Atlantic slave trade and the African Diaspora in the New World, the European Conquest and the character of the colonial order and the ongoing struggle to end the legacy of alien domination. (AY)
Restriction(s):
Can enroll if Level is Undergraduate

AAAS 239  Intro to Lit: African American  3 Credit Hours
A study of African-American literature designed to expose students to important periods, works, and authors within historical context. Topics will include slavery, reconstruction, the Great Migration, the Harlem Renaissance, and the contemporary renaissance in Black women's literature. Students will be required to read critically, discuss, analyze, and write their responses to the several literary genres that will be incorporated (fiction, drama, poetry). (PR)

AAAS 300  Introduction to AAAS  3 Credit Hours
This gateway course in the African and African American Studies Program introduces students to the intellectual debates, historical perspectives and cultural issues central to the field of African and African American Studies. The course readings draw from the disciplinary strengths of the Humanities as well as the Social and Behavioral Sciences. Course materials include selections from literature, film, music, art, drama, folk and popular culture. The course content is supplemented by attendance at off-campus events and visits to institutions featuring significant aspects of African and African American history and culture.
Restriction(s):
Cannot enroll if Class is Freshman

AAAS 304  Detroit History and Culture  3 Credit Hours
This interdisciplinary course explores the political, social, and cultural history of Detroit by examining ways various groups and classes have interacted with and been shaped by structures of power and influence. This course highlights trade and commerce, newcomers, and the influence of organizations and institutions within the contexts of labor, race, ethnic, and religious histories and current affairs, and examines how these fit into the evolution of Detroit from the 19th century to the present. Where pertinent the influence of national and international movements are included. (AY)

AAAS 313  African American Religions  3 Credit Hours
Full Title: African American Religious Experience This lecture course presents a survey of African American expressions across diverse religious traditions including Christianity, Islam, Judaism, Buddhism, and will explore contested forms of spiritual expression such as secularism and new religious movements. The course tracks these experiences from the late 18th to the 21st century in light of the contemporaneous context of social, political, and economic forces in the United States. No prerequisites. (PR)

AAAS 316  African American History  3 Credit Hours
This course will trace the experience of African Americans from their first landing in Virginia in 1619 through slavery and the Civil War. Emphasis will be placed on the origins of racism, the development of the slave system in the United States and the historical developments that led to the Civil War. (PR)

AAAS 320  African-American Music History  3 Credit Hours
A study of African American Music History from its African origins through the present. An understanding of the broad cultural, political, social, economic and media forces that have affected African Americans, their music and history- and in turn, the many important ways that African American music has influenced culture. Course examines multiple genre of music including classical, spiritual, jazz, blues and rap.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAAS 321  Untold Caribbean: Field Course  3 Credit Hours
Full Course Title: Dark History and Untold Stories: Field Class in Caribbean Historical Archaeology. Field Class: involves international travel and required costs in addition to tuition. This class explores the story behind Caribbean "paradise." We use the analytical methods of historical archaeology to "read" sites of enslavement and resistance, as well as modern museum interpretations of Caribbean heritage, and engage in the production of new archaeological knowledge through excavation. We will ask how negative or "dark" history should be remembered, what life was like on Caribbean plantations, and how histories of slavery are relevant now. Throughout, we will examine how archaeology can tell the untold stories of the many people-black, white, free, and enslaved-who never made it into the history books. We will also contribute new voices with a "mini-field season" of archaeological excavation: students can gain a glimpse into scientific archaeology, and get to try out fieldwork to see if they would gain from a full field school. (S,OC)

AAAS 322  Psychology of Prejudice  3 Credit Hours
A consideration of ethnic (including racial, sexual, and religious) prejudice from the psychological point of view, focusing on the mind of both the oppressor and the oppressed. (AY)
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
AAAS 325  Econ of Poverty/Discrimination  3 Credit Hours
An analysis of the economic aspects of poverty and discrimination. Emphasis on the theoretical economic causes of poverty and the economic bases for discriminating behavior, the impact of poverty and discrimination on individuals and society, and the effect of reform policies on the two problems. (AY).
Prerequisite(s): ECON 201 and ECON 202

AAAS 333  Intro to Gospel Music  3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recordings, videos, films, and at least one field experience. Underlying the course is the theory (Mellonie Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).

AAAS 340  Race and Evolution  3 Credit Hours
An evolutionary survey of the biological differences among human populations in response to such factors as climate, culture, disease, nutrition and urbanization. The meaning of racial variation is discussed in terms of adaptation to environmental stress. "Race" is rejected, racism is discussed. (YR).
Prerequisite(s): ANTH 101

AAAS 345  West Africa Since 1800  3 Credit Hours
A history of the West African peoples since 1800, which focuses on their unique cultural heritage. Themes include: West Africa before the advent of alien domination, the European Conquest, West Africa under the Colonial regimes, and the liquidation of colonial rule and the reassertion of West African independence. (AY).

AAAS 364  History of Islam in the US  3 Credit Hours
This course traces the long history of Islam and of Muslims in the United States (1730s-present), paying careful attention to the interaction among Muslims across the dividing lines of race, gender, immigrant generations, sect, political orientation, and class, and between Muslims and other Americans.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAAS 3640  Black Intellectual History  3 Credit Hours
Full Course Title: Black Intellectual History: From Africa to the Diaspora
This course bridges thinkers in Africa and the African Diaspora, i.e., North America, the Caribbean, and South America. It examines African and Diasporic intellectual movements from Ancient Egypt and Ethiopia to the present. Authors studied will include C.L.R. James, Frederick Douglass, Mary McLeod Bethune, Ida B. Wells-Barnett, Julius Nyere, David Walker, Nelson Mandela, W.E.B. DuBois, Franz Fanon, Martin Luther King Jr., and Cornel West. (YR)

AAAS 367  Religion and Resistance  3 Credit Hours
This course examines how religion and spirituality as cultural form has been instrumental in influencing social, political, and economic thought and the action of violent and nonviolent resistance. In such, African Americans have affirmed their humanity, their citizenship, and have exerted mechanisms of protest and change that have in-kind influenced similar thought and activity around the globe. When contemporary students are aware of this history at all, it is often without the knowledge or understanding of the various forms of resistance and the range of reason and spirituality behind this activity. The course will present key figures from within this range (AY).

AAAS 368  Black Exp in US: 1865-Present  3 Credit Hours
The history of Blacks in America is traced from the Reconstruction era and the rise of Jim Crow segregation to the Civil Rights movement of the 1960's and the current period. Special attention is paid to the migration of blacks to the north and the social-economic situation which they encountered there. Specific topics to be addressed include formulation of the NAACP. (AY).

AAAS 369  Civil Rights Movement in Amer  3 Credit Hours
A survey of race relations and civil rights activities from late 19th century to the present. The principal focus, however, is on the period since World War II, especially on the mass-based civil rights movement (1955-1965) and the various policy debates and initiatives of the past thirty years, most notably affirmative action and busing. We also examine critiques of non-violence and integrationism. (AY).

AAAS 371  African Exp in the Americas  3 Credit Hours
This course is a survey of African populations and cultures from 1500 to the present throughout the Americas. The focus of the course is on the Caribbean and Latin American contexts of these populations, but comparisons to North America will be made. Topics include the slavery, the relationship between Africans and indigenous populations, religions, politics, music, and questions of race and ethnicity. Readings will include ethnographic description, history, biography and fiction. (YR).
Prerequisite(s): ANTH 101

AAAS 385  Black Cinema  3 Credit Hours
The course will examine selected films from African American and African film traditions in order to analyze how their cultural production is responsive to the conditions of social oppression, economic underdevelopment, and neo-colonialism. How film traditions define "Black aesthetics" will also be discussed. (AY).

AAAS 388  W. African Music: Trad.&Glob.  3 Credit Hours
West African popular music contains a unique mixture of African, Cuban, European and American influences. With the advent of radio and recording, music that was once locally based is now part of a national and international popular music industry. This course offers an overview of modern West African music, both traditional and popular. The course begins with an introduction to traditional West African instruments and musical genres. Next, there is an exploration of the fusion of traditional African styles with European, Cuban and American styles during and after the colonial era. The course culminates with an examination of the contributions of West African musicians to the World Music scene, focusing on issues of representation and Fair Trade.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or AAAS 106 or AAAS 275 or HUM 100 or HUM 270

AAAS 389  Odyssey of Black Men in Amer  3 Credit Hours
This course will examine the struggle of African American men for personal, political, and creative expression. This course incorporates several literary genres (narrative, fiction, essay, drama, and poetry) and the literary voices of black men who range from professional writers to politicians, from athletes to actors. Students will be required to critically read, discuss, analyze, and write their own responses to the literature found in the texts. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
AAAS 390  Topics in Af & Af Am Studies  3 Credit Hours
This course examines problems and issues in selected areas of African and African American Studies. The specific title of the course will change in the Schedule of Classes according to content. Course may be repeated for credit when specific topic differs. (OC).
Restriction(s):
Can enroll if Level is Undergraduate or Professional Development

AAAS 393  Black Women, Rel & Spirituality  3 Credit Hours
This lecture course surveys descriptive and critical literature relevant to the religious and spiritual experience and thought of African diasporic women. Studying religiosity and spirituality among this population helps students understand this influential, culturally-constructed world view of Black women as they engage in a variety of institutions including healthcare, economic activity, the criminal justice system, politics, and social relationships. The course gives particular attention to Black feminist and Womanist literature on these topics. (AY)
Restriction(s):
Cannot enroll if Class is Freshman

AAAS 403  Minority Groups  3 Credit Hours
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. Students cannot receive credit for both AAAS 403 and AAAS 503. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

AAAS 404  Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic, and political - in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a 'natural order', obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors, and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both AAAS 404 and AAAS 504.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

AAAS 430  Race/Ethnic Health  3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health
This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequality-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy interventions. (OC)

AAAS 4401  Seminar: African Diaspora  3 Credit Hours
Research seminar on the history of the African Diaspora in the Atlantic World. This course covers examples of classic texts in the field, as well as significant new scholarship, with an emphasis on critical reading, analysis, and the development of an independent research project. Students gain a deeper understanding of the significance of the African Diaspora in the New World, derived from lectures and discussions providing an overview of this subject, as well as the micro views gleaned from sharing classroom presentation about students' individual research topics. The graduate version of this course includes weightier readings and assignments, with a research paper for potential publication.
Prerequisite(s): HIST 300 or AAAS 2755 or HIST 345 or AAAS 345
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Graduate

AAAS 449  Black Family in Contemp Amer  3 Credit Hours
The African-American family is examined in relationship to the historical and contemporary forces that have shaped its characteristic patterns of family life. These forces include the influence of slavery, urbanization, racial discrimination and urban poverty. The patterns of family life include parental roles, family structure, kinship relations, and gender roles. (YR).
Prerequisite(s): SOC 200 or SOC 201

AAAS 469  Contemporary African Amer Lit  3 Credit Hours
An intensive study of major 20th-century African-American writers. Fiction, poetry, autobiography, and drama will be examined but one genre will be stressed in any given term, e.g., the novel. Lectures will provide historical and biographical context for analysis and discussion of the works. Students cannot receive credit for both AAAS 469 and AAAS 569. (YR).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

Restriction(s):
Cannot enroll if Class is Graduate

AAAS 470  Black Women / Lit, Film, Music  3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender and class have shaped the creative work of Black women. Students will be required to read, discuss, analyze and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash, and singer Billie Holliday.
Prerequisite(s): FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 237 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303

Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters
AAAS 473  Race, Crime, and Justice  3 Credit Hours
This course is an analysis of race and its relation to crime in the criminal justice system. Students will analyze and interpret the perceived connection between race and crime, while exploring the dynamics of race, crime, and justice in the United States. This course is designed to familiarize students with current research and theories of racial discrimination within America’s criminal justice system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
- Cannot enroll if Class is Freshman

AAAS 491  Topics in African Diaspora  3 Credit Hours
This course deals with African Diasporan history from the 19th century to the present. The method is by definition cross-cultural and comparative, requiring that the works or figures under study represent a diversity of Diasporan nationalities and/or cultures. The course may focus on a wide range of topics. Students cannot receive credit for AAAS 491 and AAAS 591 when the topic title is the same.

AAAS 491C  Topics in AAAS  3 Credit Hours
Topic: Senior Research Seminar: Africa and the New World Diaspora. A history research seminar exploring the broad history of Africa and its descendants in the New World. Emphasis will be placed on a series of cross-cultural but interconnected themes including: African civilizations, the trans-Atlantic slave trade and comparative systems of servitude, the Haitian Revolution, the American Civil War, the European conquest of Africa, trans-Atlantic systems of inequality, the World Wars, the African intellectual renaissance, the Civil Rights Movement in the United States, and Independence Movements in Africa.
Prerequisite(s): HIST 300

AAAS 498  Thesis  3 Credit Hours
Students pursuing the AAAS minor as well as those interested in focusing on some particular area in African and African American Studies may wish to do research on a topic not covered in the regular AAAS curriculum. This course provides an opportunity for students to conduct such research under the direction of a qualified faculty member. The project must be defined in advance in writing. (OC).
Prerequisite(s): AAAS 275 or AAAS 239 or ENGL 239 or AAAS 106 or HIST 106
Restriction(s):
- Cannot enroll if Class is Freshman or Sophomore
- Can enroll if Level is Undergraduate

AAAS 499  Independent Study  3 Credit Hours
Students pursuing the AAAS minor as well as those interested in focusing on some particular area in African and African American Studies may wish to do research on a topic not covered in the regular AAAS curriculum. This course provides an opportunity for students to conduct such research under the direction of a qualified faculty member. The project must be defined in advance in writing. (OC).
Prerequisite(s): AAAS 275 or AAAS 239 or ENGL 239 or AAAS 106 or HIST 106
Restriction(s):
- Cannot enroll if Class is Freshman or Sophomore
- Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
- (F) fall term
- (W) winter term
- (S) summer term
- (F, W) fall and winter terms
- (YR) once a year
- (AY) alternating years
- (OC) offered occasionally

Anthropology

Anthropology, the comparative study of humanity and culture, seeks to explain both diversity and similarity in human behavior around the world. It is an academic discipline that integrates a number of specialized fields, including physical anthropology, archaeology, social and cultural anthropology, linguistic anthropology, and applied studies of human problems.

The University of Michigan-Dearborn Bachelor of Arts Degree in Anthropology emphasizes anthropology’s unique concern with the inter-dependence of human biology and culture, but also explores material culture in the past and present (through archeology), the varied experience of religion, race and gender, communication and language (through linguistic anthropology), and the critical evaluation of one’s own culture in the context of a globalized world. Many courses apply anthropological concepts to real-world problems and solutions.

A major or minor/concentration in anthropology opens doors in many fields, including law, medicine, public health, education, social work, criminal justice, international development, diplomacy, social justice work, communications, management, and various types of non-profit work. Anthropology prepares students for graduate work in anthropology, museum studies, and other social science fields. Anthropology is both a STEM science, which introduces students to multiple perspectives on the scientific method, improves scientific literacy, and develops critical thinking, as well as an interpretive endeavor in which the human experience is understood through multiple lines of evidence.

Anthropology also prepares students with the skills necessary in the modern workplace, including communication and cultural awareness, teamwork, problem solving, planning and organization, and both qualitative and quantitative analysis. The holistic approach to culture and biology is especially useful for careers in the medical sciences, while the cross-cultural exposure is essential preparation for students going into professions such as education, business, human services, or international development.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three
Complete a two-semester beginning language sequence.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

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<tr>
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<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>Ancient Greek I</td>
<td>MCL 105 and MCL 106</td>
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<tr>
<td>and II</td>
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<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
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<tr>
<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
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<tr>
<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
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<tr>
<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
<td></td>
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<tr>
<td>German I and II</td>
<td>GER 101 and GER 102</td>
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<tr>
<td>Latin I and II</td>
<td>LAT 101 and LAT 102</td>
<td></td>
</tr>
<tr>
<td>Spanish I and II</td>
<td>SPAN 101 and SPAN 102</td>
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</tr>
</tbody>
</table>

Notes:
1. At least 15 of the 24 upper level hours in ANTH must be elected at UM-Dearborn.
2. No more than 6 hours of independent study and no more than 6 hours of independent readings within the Behavioral Sciences (ANTH, PSYC, SOC) may be counted in the 120 hours required for graduation.

Field School and Field School Scholarship

Field schools teaching anthropological research methods can be life-changing experiences that provide essential training for careers in anthropology as well as practical field research experience applicable to other professions. Field schools take place all over the world and provide students with training in anthropological methods in archeology, human paleontology, bioarcheology, ethnology, linguistics, and primatology. UM-Dearborn students have attended field schools in Australia, Jordan, Kenya, Peru, Guatemala, Costa Rica, Mexico, Spain, France, Ireland, and various sites in the United States.

UM-Dearborn's anthropology program helps provide these experiences in two ways. We offer a field school scholarship that helps students subsidize the cost of attending a field school in their chosen area. The scholarship program is competitive, and preference is given to students majoring or minoring in anthropology. Anthropology faculty also run their own field schools that can be elected for UM-Dearborn credit.

Minor or Integrative Studies Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in anthropology (ANTH).
ANTH 101  Introduction to Anthropology  3 Credit Hours
Anthropology emphasizes the holistic study of human beings, in both the past and the present, and this course introduces students to the four primary subfields of the discipline (sociocultural anthropology, biological anthropology, linguistic anthropology, and archaeology). This course shows students how the sub-fields intersect to explain human biological and cultural diversity, provides students with the ability to better understand their own culture in the context of a globalized world, and discusses the applied skills of the discipline. (F, W, S)

ANTH 201  Introduction to Archaeology  3 Credit Hours
Through hands-on labs and comparison of different sites and research projects, this class provides a survey of the theoretical concepts and methods archaeological anthropologist use to learn about people through material things. Considers topics such as site formation, sampling strategies, excavation methods, lab analyses, museum presentations, heritage laws, the history of archaeology, theoretical approaches, and archaeological ethics.

ANTH 202  World Cultures  3 Credit Hours
A comparative study of politics, economics, family and religion in selected cultures—forcing, tribal, peasant, and industrial. Provides a survey of theoretical concepts in social and cultural anthropology through the comparison of ethnographic case studies. ANTH 101 recommended. (YR).

Prerequisite(s): ANTH 101

ANTH 215  Research Skills BSci  1 Credit Hour
This course teaches foundational research and critical-thinking skills necessary for the success of students in the Behavioral Sciences (including Anthropology, Psychology, and Sociology) in conducting university-level research projects, papers, and other reseach assignments. Students will learn important research skills like distinguishing between scholarly and non-scholarly sources of information, using library search tools to find peer-reviewed and scholarly sources, evaluating and analyzing information sources and using them to build informed opinions and arguments, integrating and synthesizing sources, and using sources ethically. Students will learn these skills through lectures, practice and by applying them through a series of assignments. (F, W, S)

Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

ANTH 260  Michigan Archaeology  3 Credit Hours
Our campus and our state sit on more than 10,000 years of culture and change. Long before there was a place called "Michigan", the land saw the shift from gather-hunters to farmers, and the influence of great cities far away. Three hundred years ago it was a crossroads in the rapidly changing colonial world, where traders, voyagers, and different groups of Native peoples met in friendship and in conflict—but either way the changed each other’s worlds. Even today, the material culture of Michigan and its peoples tells us about culture in ways that even a conversation cannot. This class takes Anthropology’s explicitly comparative view towards understanding the connections of past and present through both prehistoric and historical archaeology. Hands-on labs, readings, and field trips trace the development of the state from the earliest traces to the present, and focus on people and ideas left out of written history. (YR)

ANTH 270  Anthropology of Food  3 Credit Hours
The goal of this course is to introduce students to basic food theory and food practices across the world. How do ideas and practices of food and eating relate to such topics as taboo, gender, bodies, religion, kinship, and hierarchy? How are the foods people eat meaningful across multiple cultural contexts? In this course, students will develop and practice basic methodologies for food oriented ethnography including interviews and participant observation. They will also engage cultural politics of food by examining how food intersects with nation building, global networks of food production and consumption, alternative food movements, and sustainability. (OC)

ANTH 303  Intro to Women’s & Gender Stud  3 Credit Hours
This course provides an interdisciplinary overview of the key theories and topics in Women’s and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women’s and men’s lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.

Restriction(s):
Cannot enroll if Class is Freshman

ANTH 307  Forensic Anthropology  3 Credit Hours
Forensic anthropology has recently seen a lot of exposure through popular television shows like CSI and Bones. Have you ever wondered how much of what you were seeing was real? Do the dead really "talk" about their lives and how they died? This course is designed as an introductory course for students interested in demystifying and getting to know the real forensic anthropology. Forensic anthropology is a specialized sub-field of biological anthropology that applies many of the methods of biological anthropology to the discovery, excavation, and identification of human remains in a medico-legal context. In this class we learn about the human skeleton and explore the key methods that are used in the identification of individuals, such as age-at-death estimation, sex determination, stature, ancestry, and personal identification. We also deal with assessment of the different types of trauma, and whether or not we can tell the cause and manner of death. The broader ethical roles and responsibilities of forensic anthropologists are also discussed, including discussions of how we determine race/ancestry, as well as ethical responsibilities we have during the investigation of human rights abuses, disasters and criminal inquiries. (F)

Restriction(s):
Cannot enroll if Class is Sophomore or Junior or Senior

ANTH 311  Archaeology of Inequality  3 Credit Hours
Inequality has a history. This class explores these histories through archaeology with a focus on the material culture of the last 500 years. While we have written records from this time, material remains such as buildings, pottery, and human bones reveal far more. The mundane details of daily life are where inequality and injustice were (and are?) created, enforced, and resisted, and these mundane details are the material of archaeology. (OC)

Restriction(s):
Can enroll if Class is Freshman
ANTH 312  Islamophobia  3 Credit Hours
In our post-9/11 world, Islamophobia, literally fear of Islam, has gained an increasingly visible presence in the United States media, our laws and policies. But what is Islamophobia and where does it come from. How is it experienced by Muslims in everyday life? How is it similar or different from racism or other kinds of anti-Semitism? What can we do about it? And finally, what is the term Islamophobia good for? This course explores Islamophobia from the perspective of sociocultural anthropology. Students will discuss the relationships between Islamophobia and orientalism, Islamophobia in the media, in literature, and in the everyday experience of Muslims in the United States and Europe. The course ends with an examination of the Arab immigrant experience of Islamophobia in Metro Detroit. (FAY)

ANTH 320  Culture and Global Business  3 Credit Hours
Culture and Global Business lectures, exercises, and case studies explore anthropological concepts and cultural awareness needed by employees, managers, and consultants in multinational and multi-ethnic work environments. Topics include the global economy in anthropological perspective, national culture and business culture, implicit values about work and time, cross-cultural concepts of gender and cross-cultural communication. Special emphasis is given to Asia and developing societies. (AY).

ANTH 321  Untold Caribbean: Field Course  3 Credit Hours
Full Course Title: Dark History and Untold Stories: Field Class in Caribbean Historical Archaeology. Field Class: involves international travel and required costs in addition to tuition. This class explores the story behind Caribbean "paradise". We use the analytical methods of historical archaeology to "read" sites of enslavement and resistance, as well as modern museum interpretations of Caribbean heritage, and engage in the production of new archaeological knowledge through excavation. We will ask how negative or "dark" history should be remembered, what life was like on Caribbean plantations, and how histories of slavery are relevant now. Throughout, we will examine how archaeology can tell the untold stories of the many people-black, white, free, and enslaved-who never made it into the history books. We will also contribute new voices with a "mini-field season" of archaeological excavation: students can gain a glimpse into scientific archaeology, and get to try out fieldwork to see if they would gain from a full field school. (SO)

ANTH 325  Anth of Health and Environment  3 Credit Hours
Cultural conflicts over pollution, disease etiology, development and natural resources often originate and are played out in local ecosystems. Anthropologists are increasingly becoming involved as researchers, developers, and activists in these cultural strifes. This course reviews the work of environmental and medical anthropologists as well as other critical scholars who unravel the values, meanings and ideologies associated with ecological issues in given localities. Drawing on theoretical advances in critical medical anthropology, environmental anthropology and applied anthropology the course seeks to improve the knowledge and abilities of student anthropologists in their environmental health work.

ANTH 331  Human Evolution  3 Credit Hours
A survey of biological anthropology. This course is a prerequisite for all other upper-division bioanthropology courses. Topics include the human place in nature, primate biology and behavior, evolution theory, genetics, the fossil evidence for human evolution, human growth, and biocultural adaptation to the environment. (YR).

ANTH 336  Introduction to Primates  3 Credit Hours
Introduction to the fundamentals of primate paleontology, evolution, morphology, and behavior with an emphasis on understanding the evolution of primate and human social behavior. (YR).

ANTH 340  Race and Evolution  3 Credit Hours
An evolutionary survey of the biological differences among human populations in response to such factors as climate, culture, disease, nutrition, and urbanization. The meaning of racial variation is discussed in terms of adaptation to environmental stress. "Race" is rejected; racism is discussed. (AY).

ANTH 341  Human Paleontology  3 Credit Hours
A survey of the evolutionary history of life through the study of fossils and collaborative field and laboratory material. The evolution of humans and the primate order of mammals is emphasized. (AY).

Prerequisite(s): ANTH 101

ANTH 350  Prehistoric Archaeology  3 Credit Hours
Uses archaeological evidence to explore issues of central importance to the present, such as the creation of new technologies, the switch to farming, the rise of social inequality, and the beginnings of cities. Considers archaeological sites in Michigan, as well as Egypt, India, China, Europe, Mesopotamia, Mexico, Peru, and elsewhere from 2 million to 500 years ago. Prerequisite ANTH 101 recommended.

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 360  Myth, Magic, and Mind  3 Credit Hours
A broadly based introduction to the range of human mythical and magical traditions. Sophomore standing; ANTH 101 highly recommended. (YR).

Prerequisite(s): ANTH 101 or ANTH 202

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 370  Indians of North America  3 Credit Hours
The origin and development of cultures north of Mexico. A study of various culture areas and representative tribes at contact, and a political-economic analysis of the fate of American Indians since contact. The perspectives of Native American peoples are taken into account through books, novels, and poetry. Sophomore standing; ANTH 101 highly recommended. (YR).

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 371  African Exper in the Americas  3 Credit Hours
This course is a survey of African populations and cultures from 1500 to the present throughout the Americas. The focus is on Caribbean and Latin American contexts of these populations, but comparisons to North America will be made. Topics include slavery, the relationship between Africans and indigenous populations, religions, politics, music, and questions of race and ethnicity. Readings will include ethnographic description, history, biography and fiction. (YR).

Prerequisite(s): ANTH 101

ANTH 372  Anthropology of Latin America  3 Credit Hours
The course is a survey of Latin American people and cultures from the conquest to the present. It will focus on culture change and sources of conflict by analyzing topics that include the economy, kinship, ethnicity, social stratification, gender, politics, religion, and the arts. Readings will include ethnographic description, history, biography, contemporary fiction. (YR).

Prerequisite(s): ANTH 101
ANTH 373  Anthropology of Middle East  3 Credit Hours
This course explores contemporary life in the Middle East using an anthropological lens. Topics discussed include the geography and diversity of the Middle East; gender, the veil, and Orientalism; Islam, ritual, and everyday family life; and ethics and politics. The course ends with an examination of the Arab immigrant experience in Metro Detroit. Prerequisite: ANTH 101 recommended (YR).

ANTH 374  Anthropology of Europe  3 Credit Hours
Introduces anthropological approaches to European culture, emphasizing ethnographies and community studies as well as social history from the classical and medieval to the present. Will include cultural implications of industrialism and urbanization. May focus on Western or Eastern Europe during a given semester. (AY).
Prerequisite(s): ANTH 101

ANTH 376  Power & Privilege in SE Mich  3 Credit Hours
An examination of the social and cultural systems that lead to power, privilege, and inequality in American culture. This course takes a local perspective, analyzing systems of inequality as related to such factors as race, ethnicity, gender, social class and sexual orientations. Field trips to local sites are included. (YR)
Restriction(s):
Cannot enroll if Class is Freshman or Graduate

ANTH 381  Who Owns the Past?  3 Credit Hours
The past is not neutral. This class explores this idea, recognizing how representations of and stories about the past play a role in modern discussions and conflicts. Issues such as race, religion, national sovereignty, and both individual and group rights to self-determination, education, and property are all deeply entwined with how we learn about and tell each other about the past. We consider archaeological and historic sites and controversies in Asia, Africa, the Mideast, and the US, and focus on discussion and argumentative writing skills. (OC)

ANTH 390  Topics in Anthropology  3 Credit Hours
Examination of problems and issues in selected areas of anthropology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): ANTH 101

ANTH 391  Topics in Anthropology  3 Credit Hours
Examination of problems and issues in selected areas of anthropology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Junior standing required. (OC).

ANTH 397A  Honors Tutorial  3 Credit Hours
Topic: Sugar, Salt, and Fat. This tutorial takes an historical, anthropological, and biological approach to the use of sugar, salt, and fats in the human diet. People have biological requirements for sugar and salt, and these nutrients have important biological impacts on people. At the same time, the need for these nutrients forces people to migrate great distances; create new technology for production, transport, and consumption of foods containing these nutrients; organize and reorganize their social groups; and develop new economic and political organizations. Specific topics will be the rise of colonialism, slavery, global trade, and the anthropology of eating.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 398  Independent Studies in Anthr  1 to 6 Credit Hours
Readings or analytical assignments in anthropology in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. Permission of instructor required. (F,W).

ANTH 399  Independent Studies in Anthr  1 to 6 Credit Hours
Readings or analytical assignments in anthropology in accordance with the needs and interest of those enrolled and agreed upon by the student and instructor. (F,W).

ANTH 406  Culture and Sexuality  3 Credit Hours
The study of women, men, children, socialization practices, and the genesis of sex roles cross-culturally. Students cannot receive credit for both ANTH 406 and ANTH 506. ANTH 101 recommended. (YR).
Prerequisite(s): ANTH 101 or WST 275 or WGST 275 or WGST 303 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

ANTH 409  Human Body, Growth & Health  3 Credit Hours
This course provides an advanced undergraduate introduction to the topic of human growth and shows how human growth can be a reliable measure of the psychological, social, economic and moral conditions of a society. A major theme will be the interplay of biology and culture in shaping the patterns of human growth and, consequently, the health of populations and individuals.
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Junior or Senior

ANTH 410  Archaeological Field School and Lab Methods  3 Credit Hours
Full Course Title: Archaeological Field School and Lab Methods- While participating in a primary archaeological research project, students learn the methods and techniques of field archaeology and basic laboratory work, gaining experience in the scientific research process and complex problem-solving. Depending on the project, some aspects included will be survey, excavation, mapping, historical background research, and/or artifact conservation and analysis. Prerequisite ANTH 201 highly recommended.

ANTH 412  Men and Masculinities  3 Credit Hours
This course addresses the question, "What is a man?", in various historical, cross-cultural, and contemporary contexts. A major focus on the social and cultural factors that underlie and shape conceptions of manhood and masculinity in America as well as in a variety of societies around the globe. (AY).
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

ANTH 415  Nutrition and Health  3 Credit Hours
The influence of nutrition on physical and mental development from conception to adulthood. Topics include: 1) the definition and function of the essential nutrients for people, 2) basic principles of human growth and development, 3) the causes and consequences of under-and over-nutrition, 4) feeding practices for infants and children and the development of food habits, 5) nutrient and food problems in the local region and in global perspective. Students cannot receive credit for both ANTH 415 and ANTH 515. (YR).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Junior or Senior
ANTH 420  Kinship and Marriage  3 Credit Hours
A study of the diversity of kinship and marriage systems, and of the
history of kinship theory which has played a seminal role in the
development of general anthropological theory. Students cannot receive
credit for both ANTH 420 and ANTH 520. (OC).
Prerequisite(s): ANTH 101 or ANTH 201
Restriction(s):
Can enroll if Level is Undergraduate

ANTH 421  Education and Culture  3 Credit Hours
How and where do people learn? Why are there schools, and how is
schooling culturally organized? Why do school experiences tend to vary
by "race", social class, and gender? What insights does anthropology
bring to practical problems of learning and teaching? Students cannot
receive credit for both ANTH 421 and ANTH 521. ANTH 101 or SOC 200
recommended. (AY).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Level is Undergraduate

ANTH 422  Narrative Anthropology  3 Credit Hours
A consideration of alternative approaches to gaining ethnographic
understandings by reading anthropological novels (Bohannan, LeGuin),
fiction and poetry by non-western authors (Silko, Achebe), and travel
writing (Chatwin, O’Hanlon). Junior standing; ANTH 101 highly
recommended. (YR).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Junior or Senior

ANTH 425  Language and Society  3 Credit Hours
An examination of the social functions of speech through readings
and exercises, emphasizing schools and other applied settings. Topics
include ethnic and social class dialects, codeswitching, and the
organization of conversation. Students cannot receive credit for both
ANTH 425 and ANTH 525. (OC).
Prerequisite(s): ANTH 101 or LING 280
Restriction(s):
Can enroll if Level is Undergraduate

ANTH 430  Medical Anthropology  3 Credit Hours
A comprehensive examination of how culture mediates processes of
illness and healing. Comparative materials are examined which provide
a context for an anthropological analysis of modern biomedicine.
Sophomore standing; ANTH 101 highly recommended. (YR).
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 435  Human Genetics  3 Credit Hours
An analysis of human genetic variation in terms of the theory of
population genetics considers such polymorphisms as blood groups and
variant hemoglobins as well as morphological characters like stature,
skin color, and so on. Emphasis is on the genetics of human populations
and particular attention is drawn to cultural factors affecting human
biology. (OC).
Prerequisite(s): ANTH 101 and ANTH 331

ANTH 440  Religion and Culture  3 Credit Hours
An introduction to the comparative study of religious systems. Explores
religious beliefs and practices in non-Western cultures; surveys
theoretical approaches to the study of religion; and discusses how
religions grow, develop, and change. ANTH 101 recommended. (YR).
Prerequisite(s): ANTH 101

ANTH 444  Political Anthropology  3 Credit Hours
A consideration of some of the major anthropological views of politics,
focusing on the relations of power to kinship, stratification, and religion
in both states and stateless societies. Sophomore standing; ANTH 101
highly recommended. (OC).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 445  Anthropological Theory  3 Credit Hours
An historical account of the development of anthropological theory,
emphasizing the continuity between consecutive styles of explanation.
Substantial consideration of recent theoretical developments in
structuralism and ecological analysis. Sophomore standing; ANTH 101
highly recommended. (OC).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 451  Family, Sexuality, Rights  3 Credit Hours
Full Course Title: Family, Sexuality, and Human Rights in a Changing
World. This course investigates the changing possibilities for forming
families and expressing sexuality, with a focus on how nation states
and legal and cultural systems construct and respond to these changes.
Selected topics include the meanings of sex, love, marriage, and
relatedness in different historical moments; struggles for recognition of
varied kinship and family arrangements, such as interracial, interfaith,
same-sex, polygamous and multi-partner relationships; and new
technologies and their implications for family life. (YR)
Prerequisite(s): (WGST 303 or SOC 303 or ANTH 303 or PSYC 303 or
HUM 303) or (SOC 200 or SOC 201) or (ANTH 101 or ANTH 202)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 455  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including: (1)
formation and perseverance of immigrant communities and interethnic
boundaries; (2) relations between the homeland and the immigrant;
and (3) impact of migration on family life and gender roles. Students
cannot receive credit for both ANTH 455 and ANTH 555. ANTH 101
recommended. (OC).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 459  Human Osteology  3 Credit Hours
An introduction to the methods and theory of human osteology, bone
history, pathology, biomechanics and taphonomy. Osteology lecture
topics include age, sex, stature and ancestry estimation, the problems
of commingling and differential disease diagnosis. The lab component
provides hands-on skills. The course investigates how the forensic
anthropologist can apply skills to human rights and police investigations
and the nuances distinguishing theoretical approaches of forensic
anthropology and bioarchaeology.
Prerequisite(s): ANTH 331 or BIOL 130
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
ANTH 460  Economic Anthropology  3 Credit Hours
A comparative examination of the basis of political economy. Economic problems (the production and distribution of goods and services) will be considered in ecological, evolutionary, and political terms. The primary emphasis will be on traditional economies, on production and exchange at the household level, and on the effect of modern market systems on indigenous cultures. (OC).

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ANTH 470  Doing Anthropology  3 Credit Hours
A practicum of anthropological theory and method, including ethnographic interview and participant observation. Students will conduct field research and evaluate results with the help of classmates. Students cannot receive credit for both ANTH 470 and ANTH 570.

ANTH 101 or SOC 200 highly recommended. (YR).

Restriction(s):
Can enroll if Level is Undergraduate

ANTH 477  Ethnographic Film  3 Credit Hours
This course will analyze ethnographic films as a medium for the construction of meaning in and across cultures. It will teach students to understand how the putatively "real" content of documentary film creates a mixture of fantasy, news and "science." Covering texts as varied as National Geographic photographic layouts, traditional ethnographic films made by anthropologists, and auto-ethnographies of cultural groups such as Native Americans and the Trobriand Islanders of Papua, New Guinea, the course will aim to deconstruct such oppositions as indigene vs. alien, us vs. them, and self vs. other. Students cannot receive credit for both ANTH 477 and ANTH 577. (AY).

Prerequisite(s): FILM 248 or HUM 248 or ANTH 101 or ENGL 248 or JASS 248

ANTH 481  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create. (AY).

Prerequisite(s): ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

ANTH 482  Psychological Anthropology  3 Credit Hours
Cross-cultural comparison of theories of human nature, including psychoanalytic anthropology, culture-and-personality, and other theories from Western science, as well as non-Western theories about such concepts as the person, emotions and mental illness. Students cannot receive credit for both ANTH 482 and ANTH 582. ANTH 101 and PSYC 170 or 171 highly recommended. (YR).

Prerequisite(s): ANTH 101

ANTH 495  Anthropology Capstone  3 Credit Hours
Full Title: Anthropology Capstone: Contemporary Issues in Anthropology
This course is designed as a capstone for anthropology majors, and it will provide a well-rounded conclusion to undergraduate studies in anthropology. This course has three primary goals in mind: 1) to explore and critically evaluate contemporary anthropological method and theory around a central theme; 2) to provide students with opportunities to gain real research skills; and 3) to help students prepare for the job market inside and outside of academia. (W,YR)

Prerequisite(s): ANTH 101

Restriction(s):
Can enroll if Class is Junior or Senior

ANTH 498  Independent Study  1 to 6 Credit Hours
Readings or analytical assignments in anthropology in accordance with the interests and needs of students enrolled and agreed upon by the instructor and student. Written permission of instructor required.

ANTH 499  Readings in Anthropology  1 to 3 Credit Hours
For students desiring study not available in the regular course offerings. Students cannot receive credit for both ANTH 499 and ANTH 599. (FW)

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Applied Art

Minor or Integrative Studies
Concentration Only

Among the humanistic disciplines, Applied Art offers great opportunity for interdisciplinary inquiry and teaching. Art is often discussed as a universal form of communication, and the processes of visual interpretation and creation cut across human experience. In an image-centered society such as our own, the objects and critical methods of art creation provide a vital linkage point not only between disciplines, but also between students and the world around them. To provide more specific examples, students majoring in English, Anthropology, Journalism and Screen Studies, Biology, and Computer Engineering would benefit from an Applied Art minor/concentration to build both their knowledge of processes of human artistic creation and also the practical skills of digital image creation for different contexts and uses.

Minor or Integrative Studies
Concentration Requirements

Prerequisites:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ART 206</td>
<td>Basic Design-Color</td>
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And one class from (CAPD):

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<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tr>
<td>ART 201</td>
<td>Beginning Painting</td>
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<tr>
<td>ART 202</td>
<td>Beginning Drawing</td>
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<tr>
<td>ART 204</td>
<td>Beginning Watercolor</td>
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ART 210 Beginning Digital Design

ART 220 Intro to Digital Photography

Required Course:

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<tr>
<td>ART 210</td>
<td>Beginning Digital Design</td>
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<tr>
<td>ART 220</td>
<td>Intro to Digital Photography</td>
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12 credits in upper-level courses from (CAAAM):

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<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>ART 306</td>
<td>Intermediate Design-Color</td>
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<tr>
<td>ART 320</td>
<td>Intermediate Digital Photo</td>
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<td>ART 321</td>
<td>Intermediate Painting</td>
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<td>ART 322</td>
<td>Intermediate Drawing</td>
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<td>ART 323</td>
<td>Figure Drawing</td>
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<tr>
<td>ART 324</td>
<td>Intermediate Watercolor</td>
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<tr>
<td>ART/JASS 332</td>
<td>Creating the Graphic Novel</td>
<td>3</td>
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<tr>
<td>ART 360</td>
<td>Introduction to Printmaking</td>
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</tr>
<tr>
<td>ART 399</td>
<td>Independent Studies in App Art</td>
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</table>

ART 201 Beginning Painting 3 Credit Hours
Lectures on the fundamentals of painting along with work in the studio. Basic ideas of structure, composition, and color are explored through individual and group instruction. Students work from still-life and from the model. This is a broad introductory painting course designed for the student unfamiliar with fundamentals of design and color. Material: acrylics. (YR).

ART 202 Beginning Drawing 3 Credit Hours
Lectures alternate with studio work in the investigation of drawing fundamentals. Students receive individual and group instruction as they work from still life setups, nature, and from the model. Emphasis is placed on the development of critical skills and perceptual drawing techniques for students with little or no studio experience. Pastel, charcoal, conte, pencil, and inks will be used. (YR).

ART 204 Beginning Watercolor 3 Credit Hours
Through lectures and studio work, students will explore the fundamentals of watercolor painting. To demonstrate the dynamics of the medium, a variety of approaches and techniques will be used, including realistic, abstract, and experimental painting. Subject matter includes still life, the figure, possible outdoor sketching and painting from the imagination. All levels of students are given individual guidance. (YR).

ART 206 Basic Design-Color 3 Credit Hours
Students will be introduced to the complex and diverse subject of color. The areas of study include principles and theories of color, practical application and technique, and the phenomenon of color interaction. The art elements (line, shape, value, space, form, and texture) and design principles will be applied within specific assignments. Compositional concerns and creative problem solving will be emphasized. (YR).

ART 210 Beginning Digital Design 3 Credit Hours
This course introduces students to the fundamentals of digital design, and how it fits into our evolving media landscape. It teaches skills in areas of digital illustration, image making, augmented reality, and web design. Methods of both creating and editing creative digital projects will be covered, including color theory, design concepts, layers, tools, optimization of content for web and multimedia content. In addition, students will be able to identify the impact and development of digital technology on everyday life through readings and discussions related to new media history, visual literacy, and critical theory, while allowing students to apply their own specific interests to each project.

ART 220 Intro to Digital Photography 3 Credit Hours
This course focuses on the creative use of digital imaging software and hardware. Students are exposed to contemporary artists and professionals working in traditional and digital photography. Students also consider critical issues surrounding the aesthetic, ethical and theoretical aspects of digital imaging technology and current photographic practice. Application of these approaches, processes and concepts are discussed in terms of their relevance within and beyond art practices, including art as personal expression and as a professional field. Each assignment engages students' critical thinking as they explore the artistic possibilities of digital photography while expanding their technological and aesthetic knowledge. During project critiques, students practice articulating their thought processes in relation to their own work and the work of their peers.

ART 306 Intermediate Design-Color 3 Credit Hours
The design emphasis will be on line and movement, positive/negative space, push/pull dynamics and a study of the nature of grids. The color emphasis will focus on tertiary colors, the effect of variations in color intensity and tonal contrast. There will also be a study of various twentieth century design movements such as the Russian Avant Garde, Constructivism and the Bauhaus, with some assignments modeled on these styles.

Prerequisite(s): ART 206
Restriction(s): Can enroll if Level is Undergraduate

ART 320 Intermediate Digital Photo 3 Credit Hours
Full Title: Intermediate Digital Photography Intermediate Digital Photography builds on skills learned in ART 220: Intro to Digital Photography. Students further develop their digital camera and photo editing software skills through a series of creative projects that explore alternative approaches to photography such as new media and artist books. Students continue to investigate issues related to the processes, theory, history, and reception of photographic imagery through readings and discussions. Projects include lessons on advanced photo editing, photo manipulation, and HDR (High Dynamic Range), while allowing students to build a portfolio of works in their specific areas of photographic interest or career paths.

Prerequisite(s): ART 220

ART 321 Intermediate Painting 3 Credit Hours
Various painting approaches, styles and concepts are explored beyond the basic level through lectures and studio work. Students are encouraged to develop their own personal style as they master new techniques and types of subject matter. This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.

Prerequisite(s): ART 201

ART 322 Intermediate Drawing 3 Credit Hours
The fundamentals of drawing are refined beyond the basic level in a variety of media through lectures and studio work. Students are encouraged to develop their own personal style as they master new techniques and types of subject matter. This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.

Prerequisite(s): ART 202

ART 323 Figure Drawing 3 Credit Hours
This course is designed to teach each student about the complex human form through the act of observation, drawing, and memorization of specific anatomical terms. Emphasis will be on proportion, anatomy, composition, and expression. Students will draw from a live model.

Prerequisite(s): ART 202
ART 324 Intermediate Watercolor  3 Credit Hours
Various watercolor painting approaches, styles and concepts are explored beyond the basic level through lectures and studio work. Students are encouraged to develop their own personal style as they master new techniques and types of subject matter (still life, the figure, landscape and painting from the imagination). This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.
Prerequisite(s): ART 204

ART 332 Creating the Graphic Novel  3 Credit Hours
This course focuses on the creation of an original graphic novel from inception to fully developed story. Students work on character, plot development, dialogue, drawing style, and layout planning, and are encouraged to introduce any cross-disciplinary techniques such as digital applications when appropriate. Lectures and readings consider contemporary media. This course is repeatable once in order for students to develop their skills. When repeating, the content and assignments are determined in consultation with instructor.
Prerequisite(s): ART 202 or ART 206
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

ART 360 Introduction to Printmaking  3 Credit Hours
This studio course is an introduction to the fundamentals of printmaking. The basic techniques of intaglio, lino-cut, chine colle, lithography and monotype printing methods are utilized in projects. As a deeply interdisciplinary practice, printmaking engages with other artistic media of drawing, painting, and collage. Each student is encouraged to incorporate other materials based on her/his major, interests or expertise.
Prerequisite(s): ART 201 or ART 202 or ART 204 or ART 206

ART 390 Topics in Applied Art  3 Credit Hours
Study of various media and techniques in selected areas of applied art. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when the topics differ.
Restriction(s):
Can enroll if Level is Undergraduate

ART 399 Independent Studies in App Art  1 to 3 Credit Hours
Readings or analytical assignments in applied art in accordance with the needs and interests of those enrolled and agreed upon by the student and the instructor. (FW).

Applied Statistics

The ability to analyze and use such data requires a new set of skills that a Bachelor of Arts in Applied Statistics, or a Bachelor of Science in Applied Statistics offers.

Statistics is the science of learning from data. It includes planning for the collection of data, managing data, analyzing, interpreting, and drawing conclusions from data, and identifying problems, solutions and opportunities using the analysis. Massive amounts of data are being collected from digital applications and mobile devices in addition to those from the fields of engineering, environment, finance, healthcare, retail, and social sciences. The volume, variety and velocity of this data poses unique opportunities and challenges. The ability to analyze and use such data requires a new set of skills that an Applied Statistics major offers. This makes Applied Statistics one of the fastest growing career fields today. The Applied Statistics major builds critical thinking and problem solving skills in data analysis and empirical research. It prepares students for careers in business, industry, and government as well as for advanced degree programs in statistics and quantitative fields. The applied statistics major allows students to focus on their passions including genetics, healthcare, pharmaceuticals, public transportation, automotive areas, communication systems, financial markets, utilities, public policy, public health, government, manufacturing, quality control and others.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course


Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

Ancient Greek I and II  MCL 105 and MCL 106
Arabic I and II  ARBC 101 and ARBC 102
Armenian I and II  MCL 111 and MCL 112
24 credit hours at the 300+ level is required.

**Major Requirements**

24 credit hours at the 300+ level is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>Mathematics Core</strong></td>
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<td>6 credits required:</td>
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<tr>
<td>MATH 325</td>
<td>Probability</td>
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<tr>
<td>MATH 425</td>
<td>Mathematical Statistics</td>
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<td></td>
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<tr>
<td>STAT 301</td>
<td>Biostatistics I</td>
<td>4</td>
</tr>
<tr>
<td>or STAT 325</td>
<td>Applied Statistics I</td>
<td></td>
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<tr>
<td>STAT 327</td>
<td>Statistical Computing</td>
<td>3</td>
</tr>
<tr>
<td>STAT 430</td>
<td>Applied Regression Analysis</td>
<td>3</td>
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<tr>
<td>STAT 440</td>
<td>Design and Analysis of Expermt</td>
<td>3</td>
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<td></td>
<td><strong>Electives in Statistics</strong></td>
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<tr>
<td></td>
<td>Select any two upper level STAT courses (6 credit hours):</td>
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<td><strong>Cognates</strong></td>
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<td>Select 6 credit hours from the following:</td>
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<td>DS 350</td>
<td>Quantitative Model and Anly II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 335</td>
<td>Experimental Economics</td>
<td>3</td>
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<tr>
<td>ECON 4015</td>
<td>Introduction to Econometrics</td>
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<tr>
<td>IMSE 4675</td>
<td>Six Sigma &amp; Stat Proc Improv</td>
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<td>MATH 300</td>
<td>Math Lang Proof &amp; Struct</td>
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<td>MATH 413</td>
<td>Linear Algebra</td>
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<tr>
<td>MATH 420</td>
<td>Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>MATH 451</td>
<td>Advanced Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 472</td>
<td>Intro to Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 473</td>
<td>Matrix Computation</td>
<td>3</td>
</tr>
<tr>
<td>MATH 492</td>
<td>Introduction to Topology</td>
<td>3</td>
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</tbody>
</table>

**Prerequisites to the Major**

Students majoring in Applied Statistics must take the following prerequisites:

- **Chinese I and II**  CHIN 101 and CHIN 102
- **French I and II**  FREN 101 and FREN 102
- **German I and II**  GER 101 and GER 102
- **Latin I and II**  LAT 101 and LAT 102
- **Spanish I and II**  SPAN 101 and SPAN 102

**Notes:**

1. At least 12 of the 24 upper level credit hours in Statistics (STAT) must be elected at UM-Dearborn.
2. Students cannot receive credit for both STAT 301 and STAT 325.
3. Students wishing to use graduate level courses (STAT 500+) as part of the 24 credit hours required for the major must submit a Petition to obtain the approval of the Applied Statistics Program Advisor.

**Minor or Integrative Studies Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses (300 or above level) in Applied Statistics (STAT). Only one of STAT 301 or STAT 325 can be used to satisfy this requirement. Students with majors in mathematics, the natural sciences, or the social sciences may find the minor in Applied Statistics to be a valuable supplement to their major.

- **STAT 263 Introduction to Statistics**  3 Credit Hours
  - Frequency distributions and descriptive measures. Populations, sampling, and statistical inference. Elementary probability and linear regression, use of statistical computer packages to analyze data. Students intending to elect this course should have taken at least one year of high school algebra. (F,W,S).
- **STAT 301 Biostatistics I**  3 Credit Hours
  - Samples and populations, quantitative vs. categorical data; clinical vs. epidemiological studies; comparative displays and analysis; linear regression. Estimation of effect size is emphasized along with the P-value for a statistical test: difference of means in simple comparative data together with a confidence interval and t-test; relative risk for appropriate categorical data; slope of a regression line together with a confidence interval and t-test. Study design is emphasized: clinical trials in experimental settings; case-control and cohort studies in epidemiological settings. Students are expected to make presentations interpreting and reporting the results of research from the literature. Students can receive credit for only one of MATH 301, MATH 363, STAT 301, CRJ 383, SOC 383, STAT 325.
- **Prerequisite(s):** MATH 113 or MATH 115
- **STAT 305 Intro. to Data Science**  3 Credit Hours
  - With increasing availability of data, companies, governments, and nonprofits alike are striving to convert this data into knowledge and insight. This course will provide students with the basic skill set needed to handle such data. The course will focus on three broad areas: inferential thinking, computational thinking, and real-world applications. We will discuss data collection, data cleaning and exploratory analysis of data so that students can connect the data to the underlying phenomena and be able to think critically about the conclusions that are drawn from the data analysis. The students will also learn how to write short programs to be able to automate the data analysis process developing an applied understanding of different analytics methods, including linear regression, logistic regression, clustering, data visualization, etc. Most of the material will be taught using real world data. (YR)
STAT 325 Applied Statistics I 4 Credit Hours
This course studies the principles and applications of statistics. Topics include descriptive statistics, random variables, probability distributions, sampling distributions, the central limit theorem, confidence intervals, hypothesis testing for mean and variance and the use of normal, chi-square, F and t distributions in statistical problems. Other topics are selected from regression and correlation, the design of experiments and analysis of variance. Students can receive credit for only one of CRJ 383, MATH 301, 363, STAT 301, 363, SOC 363 and STAT 325. (F,W)
Prerequisite(s): MATH 113 or MATH 115 or Mathematics Placement with a score of 116

STAT 327 Statistical Computing 3 Credit Hours
This course focuses on computational techniques that are crucial for statistics applications. Using the statistical packages R and SAS, the course teaches students about importing and storing data, manipulating and visualizing data, debugging and re-sampling, as well as simulation methods including bootstrap and Monte Carlo methods. (YR)
Prerequisite(s): STAT 325

STAT 330 Intro to Survey Sampling 3 Credit Hours
An introduction to survey sampling techniques assuming only a limited knowledge of higher-level mathematics. Topics include: simple and stratified random sampling, estimation, systematic sampling, simple and two stage cluster sampling, population size estimation.

STAT 390 Topics in Applied Statistics 3 Credit Hours
A course designed to offer selected topics in applied statistics. The specific topic or topics will be announced together with the prerequisites when offered. Course may be repeated for credit when specific topics differ. (OC)
Restriction(s):
Can enroll if Level is Undergraduate

STAT 430 Applied Regression Analysis 3 Credit Hours
Topics include single variable linear regression, multiple linear regression and polynomial regression. Model checking techniques based on analysis of residuals will be emphasized. Remedies to model inadequacies such as transformations will be covered. Basic time series analysis and forecasting using moving averages and autoregressive models with prediction errors are covered. Statistical packages will be used. Students cannot receive credit for both STAT 430 and STAT 530.
Prerequisite(s): STAT 425 or STAT 325 or IMSE 317

STAT 440 Design and Analysis of Expermt 3 Credit Hours
An introduction to the basic methods of designed experimentation. Fixed and random effects models together with the analysis of variance techniques will be developed. Specialized designs including randomized blocks, Latin squares, nested, full and fractional factorial will be studied. A statistical computer package will be used. (W).
Prerequisite(s): STAT 326 or STAT 425 or STAT 325

STAT 445 Survival Analysis 3 Credit Hours
Full Course Title: Reliability and Survival Analysis This course focuses on fundamentals of statistics with emphasis on environmental problems and their relevance in everyday life. The course topics include data visualization, parametric and non-parametric statistical inferences such as multiple linear regression, analysis of bivariate measurements, contingency table, goodness of fit tests, and comparison of several groups, and ANOVA testing. (AY)
Prerequisite(s): STAT 430
Restriction(s):
Can enroll if Level is Undergraduate

STAT 450 Multivariate Stat Analysis 3 Credit Hours
An introduction to commonly encountered statistical and multivariate techniques, while assuming only a limited knowledge of higher-level mathematics. Topics include: multivariate analysis of variance, multivariate regression, principal components and factor analysis, canonical correlation, and discriminant analysis.

Prerequisite(s): STAT 430

STAT 455 Environmental Statistics 3 Credit Hours
The primary objective of the course is to introduce statistical techniques to make data driven decisions to students majoring in the environmental and biological sciences. This course aims to nurture the importance of statistical methods to enhance the understanding of issues related to environmental sciences. A one-semester course cannot be exhaustive in depth and width of literature but the aim of this course is to create interest and encourage students to delve more into the subject. (AY)

Restriction(s):
Can enroll if Level is Undergraduate

STAT 460 Time Series Analysis 3 Credit Hours
An introduction to time series, including trend effects and seasonality, while assuming only a limited knowledge of higher-level mathematics. Topics include: linear Gaussian processes, stationarity, autocovariance and autocorrelation; autoregressive (AR), moving average (MA) and mixed (ARMA) models for stationary processes; likelihood in a simple case such as AR(1); ARIMA processes, differencing, seasonal ARIMA as models for non-stationary processes; the role of sample autocorrelation, partial autocorrelation and correlograms in model choice; inference for model parameters; forecasting: dynamic linear models and the Kalman filter.
Prerequisite(s): STAT 430

STAT 490 Topics in Applied Statistics 3 Credit Hours

STAT 490A Topics in Applied Statistics 3 Credit Hours

TOPIC TITLE: Multivariate Statistical Analysis A coverage of commonly encountered statistical and multivariate techniques, while assuming only a limited knowledge of higher-level mathematics. Topics include: Multivariate analysis of variance, multivariate regression, principal components and factor analysis, canonical correlation, discriminant analysis, and cluster analysis.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Arab American Studies

Dearborn and its neighbors are home to one of the largest- and most diverse- communities of people of Arab descent outside of the Middle East. The Center for Arab American Studies at UM-Dearborn encourages students to develop a coherent understanding of the unique circumstances surrounding the incorporation of Arab immigrants into American society; the broad range of diversity found within Arab American communities; how the Arab American experience is shaped by local, national and international conditions; and the contributions of Arab Americans to American culture and history.
Minor or Integrative Studies
Concentration Requirements
A minor or concentration requires 15 credit hours of upper level coursework including AAST 3150 and 12 additional credits of any 300/400; 3000/4000 level AAST courses. Other disciplines offer courses relevant to the AAST minor. Students will be able to count one such course toward the minor/concentration with approval of the AAST faculty advisor by petition.

The Arab American Studies (AAST) Certificate is an interdisciplinary undergraduate and post-baccalaureate certificate that prepares students for working and living in our diverse metropolitan region and world by concentrating on the historical and current experiences of Arab and Muslim Americans and the relevance of those experiences for understanding race and ethnicity in the U.S. and globally. The interdisciplinary approach of the certificate provides students with analytical frameworks for understanding how social, cultural, legal, and political factors influence the lives of Arab American individuals, families, and communities. The program of study examines a broad spectrum of diversity to understand the ways that immigration, racism and discrimination, gender and sexuality, class, ethnicity, culture, and religion intersect with one another in people's lives.

Certificate Requirements

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>3 credits from:</td>
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<tr>
<td>AAST 3150</td>
<td>Intro to Arab American Studies</td>
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<tr>
<td>AAST 3151</td>
<td>Public Cultural Work</td>
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<tr>
<td>9 credits from:</td>
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<td>AAST 3150</td>
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<tr>
<td>AAST 3634</td>
<td>History of Islam in the US</td>
<td></td>
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<tr>
<td>AAST 3676</td>
<td>Arab Americans Since 1890</td>
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<td>AAST 473</td>
<td>Arab American Women Writers</td>
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<tr>
<td>AAST 4677</td>
<td>Arab American Identity</td>
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<tr>
<td>AAST 4678</td>
<td>Middle Eastern Diasporas</td>
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<tr>
<td>ANTH 373</td>
<td>Anth Persp on the Middle East</td>
<td></td>
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<tr>
<td>HHS 480</td>
<td>Arab American Health</td>
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<tr>
<td>Total Credit Hours</td>
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</table>

NOTES:
1. A maximum of 3 credit hours of transfer coursework may be counted toward the minimum 12 credit hours required for the program by Petition to the Program Director.
2. None of the courses applied to the certificate may be taken pass/fail.
3. A minimum 3.0 GPA in the UM-Dearborn courses counting toward the AAST certificate is required at the time of graduation and/or awarding of the certificate.

AAST 238  Intro to Lit: Arab American  3 Credit Hours
This course in an introduction to Arab American literature, its historical and cultural contexts and contemporary relevance. Topics will include the literary and cultural productions of Arab immigrants, their transnational vision, and explorations of such concepts as home, memory and identity; the literary, dramatic and poetic responses of Arab American writers to 9/11 and the ongoing war on terror; the role Arab American literature in offering different versions of Arab and Arab American lives and experiences from the one circulated in mainstream media, Hollywood cinema and culture.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

AAST 267  Arab & Arab American Workshop  3 Credit Hours
The Arab and Arab American Writers Workshop is a creative writing workshop focusing on poetry and fiction. Students will explore Arab American literature, writers, and themes. Students are expected to work on their own manuscripts as well as critique outside readings. The workshop will be conducted under the guidance of Arab and Arab American faculty and is open to all students.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

AAST 3150  Intro to Arab American Studies  3 Credit Hours
This course explores the local, national, and global conditions through which Arab American identity and its alternatives take shape. It introduces students to humanities and social science approaches to the field of Arab American Studies.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAST 3151  Public Cultural Work  3 Credit Hours
Full Title: Public Cultural Work in Arab Detroit. This course explores the field of public humanities work while providing a topical focus on metro-Detroit based Arab American history and culture. Roughly half of the course will be used to explore different approaches to public humanities work undertaken by scholars. The second half of the course will provide the historical and social context for understanding a particular research question to be examined jointly by the instructor, students, and a local cultural institution. Students will engage in intensive research and work with a cultural institution to represent their findings to the public. Students cannot receive credit for both AAST 3151 and HIST 3672. (W)

AAST 3634  History of Islam in the US  3 Credit Hours
This course traces the long history of Islam and of Muslims in the United States (1730s-present), paying careful attention to the interaction among Muslims across the dividing lines of race, gender, immigrant generations, sect, political orientation, and class, and between Muslims and other Americans.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

AAST 3673  Arabs & Muslims in Media  3 Credit Hours
Full Title: Arabs and Muslims in the Media This course examines how perception of Arabs and Muslims took shape in the U.S. from the late nineteenth century through the present. Using historical developments as a conduit, we explore the treatment of Arabs and Muslims in news outlets, print media, film, and T.V. productions. For example, we analyze the motivation, plot construction, casting, and content of big budget Hollywood movies for patterns of stereotypes and representations/ misrepresentations. (FAY)
AAST 3676  Arab Americans Since 1890  3 Credit Hours
This is a survey of immigration from the Arab Middle East from 1890 to the present. Readings from available scholarship, discussions, and reports facilitate exploring the Arabic-speaking immigrants’ early and recent experiences as art of U.S. society, including settlement, work, worship, military service, leisure, intellectual life, and primary and formal affiliations across the U.S.

AAST 373  Anthropology of Middle East  3 Credit Hours
This course explores contemporary life in the Middle East using an anthropological lens. Topics discussed included the geography and diversity of the Middle East; gender, the veil, and Orientalism; Islam, ritual, and everyday family life; and ethics and politics. The course ends with an examination of the Arab immigrant experience in Metro Detroit. No Prerequisites, but ANTH 101 is recommended. (AY)

AAST 381  Intro to Postcolonial Studies  3 Credit Hours
This course offers a general introduction to Postcolonial Studies - a field of cultural inquiry that questions how personal identity (specifically race, language, and ethnicity) shapes, and is shaped by, the politics of colonization and nationalism. Students will study the subject of Postcolonial Studies by examining a variety of cultural and linguistic objects (literature, film, TV-journalism, slave- and middle-passage-narrative, and political manifesto) from a variety of cultural perspectives (Arab American, Anglo-Indian, West African, and Caribbean). Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250

AAST 390  Topics in Arab American Study  3 Credit Hours
Examination of various topics dealing with Arab American Studies. Titles will change according to content and schedule of classes. Course may be repeated for credit when specific topic differs. (OC).

AAST 4677  Arab American Identity  3 Credit Hours
Extensive discussions and critical analysis of the main markers of Arab American identity formation from late nineteenth century to present. This seminar provides in-depth assessments of immigrant narratives from various sources and disciplinary approaches on specific racial, ethnic, and gender experiences within the larger U.S. context. Additional assignments distinguish the graduate version of this course from the undergraduate version. Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Level is Undergraduate

AAST 4678  Middle Eastern Diasporas  3 Credit Hours
This course explores the diasporas of Arabs, Turks, Assyrians, and Iranians living in Europe and the Americas that have occurred since the 1880s. It pays careful attention to how “aspects of diaspora” shape, mimic, transplant, and undermine the political and economic regimes of which they are part. The reception of Middle Eastern communities in different national contexts and historical periods receive special attention as do their adaptive strategies as religious, ethnic, gendered, and racialized minorities. Those enrolled in the graduate level of the course pursue additional readings and assignments. Prerequisite(s): AAST 3150 or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

AAST 473  Arab American Women Writers  3 Credit Hours
This course examines the literary and cultural contributions of Arab and Arab American women novelists, poets, filmmakers and artists to the development and consolidation of cultures of understanding and coexistence; explores the relations between, among others, citizenship and belonging, race and national security, gender and geographical mobility, and ethnic minorities and mainstream consciousness; stresses how literary and artistic productions of Arab and Arab American women writers and artists fosters alternative visions of socio-cultural coexistence, dialogue, and hospitality by means of technical and stylistic experimental and renovation. For graduate credit take AAST 573. Students cannot receive credit for both AAST 473 and AAST 573. Restriction(s):
Cannot enroll if Class is Freshman

AAST 490  Topics in Arab Amer Studies  3 Credit Hours
The content of this course will vary. All courses which will run under this number will cover Arab American issues.

Arabic Studies
The minor/concentration in Arabic Studies offers a variety of courses in Arabic on cultural topics including Arabic literature, cinema, and modern history. The program welcomes both heritage students and students with no background in Arabic. While the entry-level courses focus on the basic skills of language proficiency, the upper-level courses focus on the cultural issues of the Arab world, and trains students in developing their analytical and critical skills.

Minor or Integrative Studies Concentration Requirements
A minor or concentration consists of 12 credit hours of upper-level courses in Arabic (ARBC) (excluding ARBC 350).

Prerequisites to the Minor/Concentration
Non-native speakers of Arabic must successfully complete ARBC 202: Intermediate Arabic II (at or outside UM-Dearborn) or demonstrate equivalent Arabic Proficiency Exam offered by LCC Department.

ARBC 101  Beginning Arabic I  4 Credit Hours
First course in the two-course elementary Arabic sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and function in Arabic culture. (F,W,S).

ARBC 102  Beginning Arabic II  4 Credit Hours
Second course in the two-course elementary sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, writing, and culture. (F,W,S).
Prerequisite(s): ARBC 101 or MCL 101 or Arabic Language Placement with a score of 102 or Arabic Language Placement with a score of 201 or Arabic Language Placement with a score of 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302
ARBC 201 Intermediate Arabic I 4 Credit Hours
An intermediate-level course designed to increase proficiency in listening, speaking, reading, and writing in a cultural context. Emphasis is placed on acquiring new vocabulary and expanding the use of grammar structures. (YR).
Prerequisite(s): ARBC 102 or MCL 102 or Arabic Language Placement with a score of 201 or Arabic Language Placement with a score of 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302

ARBC 202 Intermediate Arabic II 4 Credit Hours
Second course in the two-course intermediate Arabic sequence. Continued emphasis on the development of the four skills of listening, speaking, reading, and writing.
Prerequisite(s): ARBC 201 or MCL 201 or Arabic Language Placement with a score of 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302

ARBC 301 Higher Intermediate Arabic I 3 Credit Hours
This course is designed for students who have already had the equivalent of four semesters of Arabic instruction. The course emphasizes the four language skills with specific attention to the productive skills, oral and written. The course introduces authentic reading materials drawn from different disciplines such as religion, literature, history, and politics, reflecting different styles of Arabic and different periods. (F)
Prerequisite(s): ARBC 202 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302

ARBC 302 Higher Intermediate Arabic II 3 Credit Hours
A continuation of ARBC 301. It continues to develop the four language skills with specific attention to the productive skills, oral and written. The course introduces authentic reading materials drawn from different disciplines such as religion, literature, science, politics, reflecting different styles of Arabic and different periods. (W, YR)
Prerequisite(s): ARBC 301 or Arabic Language Placement with a score of 301 or Arabic Language Placement with a score of 302

ARBC 303 Advanced Arabic 3 Credit Hours
This course is an introduction to narrative traditions in Arabic through the close readings of a variety of essays. It is designed to give students experience in reading specialized short texts including modern Arabic literature and the social sciences. Each session will be organized around a particular author, genre, theme, or period, including the novel, political essay, the short story, historical prose, drama, and film, with special emphasis on the Arabic literature of Egypt and the Levant.
Prerequisite(s): ARBC 302
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

ARBC 305 Language of Business 3 Credit Hours
An introduction to the language and cultural practices of the Arab world of business. Particular emphasis will be placed on learning the terminology used in typical business correspondence and documents related to the world of finance, investment, import, and export, and commerce. A variety of businesses will be examined and opportunities for practice in reading and composing business letters will be provided. (W, AY)
Prerequisite(s): ARBC 301

ARBC 306 Intro to the Quran 3 Credit Hours
Full Course Title: Introduction to the Quran This is an interdisciplinary approach to studying the Qur'an as a religious revelation, literary text, and cultural symbolic language. The course will cover the historical context in which the Qur'an was revealed, disseminated and compiled as a religious scripture. Also, will cover major schools of interpretations and theological doctrines and its political, ideological transformations throughout Islamic history with a special focus on modern times. The class will be conducted in English with no prerequisite of Arabic. However, students minoring in Arabic, in order to receive credits counting for their minor, they are required to write their papers in Arabic. (S,OC)
Art History

The Bachelor of Arts in Art History offers the student practical, critical, and historical studies in architecture, sculpture, painting, the decorative arts, printmaking, and photography. Each art is considered a creative process which, like language, has developed as an expression of human ideas, emotions, and life conditions. The history of these arts is presented as a visual record of the evolution of human societies, which can give the student a valuable introduction to the various world civilizations.

Students may elect one of two concentration tracks in Art History: Track A – Art History, or Track B – Museum Studies. The major programs offer the student a broad humanistic education within the context of an undergraduate degree and prepare the student for graduate work in academic, museum, or commercial fields.

The Art History program offers a wide variety of courses in western art and also in non-western areas like Chinese, Japanese and Islamic art and architecture. Research assignments in classes often take students to area art institutions like the Detroit Institute of Arts, the University of Michigan Museum of Art, the Kelsey Museum of Archaeology, and the Toledo Museum of Art. Majors are encouraged to be interns in these museums as well as area galleries, historic houses, and historical museums. The two tracks offer a broad humanistic education and prepare the student for work in academic, museum or commercial fields.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language</th>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>ARBC 101 and ARBC 102</td>
<td>Arabic I and II</td>
<td>9</td>
</tr>
<tr>
<td>Armenian</td>
<td>MCL 105 and MCL 106</td>
<td>Armenian I and II</td>
<td>9</td>
</tr>
<tr>
<td>Chinese</td>
<td>CHIN 101 and CHIN 102</td>
<td>Chinese I and II</td>
<td>9</td>
</tr>
<tr>
<td>French</td>
<td>FREN 101 and FREN 102</td>
<td>French I and II</td>
<td>9</td>
</tr>
<tr>
<td>German</td>
<td>GER 101 and GER 102</td>
<td>German I and II</td>
<td>9</td>
</tr>
<tr>
<td>Spanish</td>
<td>SPAN 101 and SPAN 102</td>
<td>Spanish I and II</td>
<td>9</td>
</tr>
</tbody>
</table>

Prerequisites to the Major

Students majoring in Art History (Concentration Track A) or Museum Studies (Concentration Track B) are required to take the following Prerequisites:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH 101</td>
<td>Understand Art-Ancient to 1400</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 102</td>
<td>Understanding Art 1400 to Now</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 103</td>
<td>Arts of Asia</td>
<td>3</td>
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</tbody>
</table>

Total Credit Hours 15
## Major Requirements

### Concentration Track A: Art History

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
<td></td>
<td></td>
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<tr>
<td>Select one course from each of the five following areas:</td>
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</table>

#### Asian/Non-Western (CAAS):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH/HUM 311</td>
<td>Art of China</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 312</td>
<td>Art of Japan</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 313</td>
<td>Chinese Painting</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 315</td>
<td>Early Chinese Art and Culture</td>
<td></td>
</tr>
<tr>
<td>ARTH 384</td>
<td>Islamic Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 385/</td>
<td>Islamic Decorative Arts</td>
<td></td>
</tr>
<tr>
<td>RELS 384</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARTH/WGST 416</td>
<td>Earl Mod Jpn Paint&amp;Wood Prnts</td>
<td></td>
</tr>
</tbody>
</table>

#### Ancient/Classical (CAAC):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH 319</td>
<td>Egyptian Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 321</td>
<td>Greek Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 322</td>
<td>Roman Art</td>
<td></td>
</tr>
<tr>
<td>ARTH/RELS 327</td>
<td>Gods, Myth and Worship</td>
<td></td>
</tr>
<tr>
<td>ARTH/WGST 425</td>
<td>Women in Classical Antiquity</td>
<td></td>
</tr>
<tr>
<td>ARTH 426</td>
<td>City of Ancient Rome</td>
<td></td>
</tr>
<tr>
<td>ARTH 427</td>
<td>Greek Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 428</td>
<td>Roman Art and Memory</td>
<td></td>
</tr>
</tbody>
</table>

#### Medieval (CAME):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ARTH/RELS 331</td>
<td>Erly Christian Byzant Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 332</td>
<td>Early Med and Romanesque Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 333</td>
<td>Gothic Art and Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 334</td>
<td>The 14th Century</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM/RELS/WGST 335</td>
<td>Women in Medieval Art</td>
<td></td>
</tr>
</tbody>
</table>

#### Renaissance/Baroque (CARB):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH 341</td>
<td>Art&amp;Arch in Early Ren Florence</td>
<td></td>
</tr>
<tr>
<td>ARTH 342</td>
<td>High Renaissance and Mannerism</td>
<td></td>
</tr>
<tr>
<td>ARTH 343</td>
<td>Renaissance &amp; Reformation Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 344</td>
<td>Italian Renaissance Sculpture</td>
<td></td>
</tr>
<tr>
<td>ARTH 351</td>
<td>Southern Renaissance Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 352</td>
<td>Northern Baroque Art</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 434</td>
<td>Renaissance and Baroque Rome</td>
<td></td>
</tr>
<tr>
<td>ARTH 454</td>
<td>Rembrandt</td>
<td></td>
</tr>
</tbody>
</table>

#### Modern (CAMA):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH/HUM/HIST 305</td>
<td>The Arts &amp; Culture of Detroit</td>
<td></td>
</tr>
<tr>
<td>ARTH 360</td>
<td>Art of Glass</td>
<td></td>
</tr>
<tr>
<td>ARTH 361</td>
<td>American Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 362</td>
<td>Impressionism and Post-Impress</td>
<td></td>
</tr>
<tr>
<td>ARTH 363</td>
<td>Arts of the Twentieth Century</td>
<td></td>
</tr>
<tr>
<td>ARTH 364</td>
<td>Picasso</td>
<td></td>
</tr>
<tr>
<td>ARTH 365</td>
<td>Modern Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 366</td>
<td>The Modern Print</td>
<td></td>
</tr>
<tr>
<td>ARTH 367</td>
<td>Contemporary Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 368</td>
<td>American Photography</td>
<td></td>
</tr>
<tr>
<td>ARTH 375</td>
<td>Urban Design Perspectives</td>
<td></td>
</tr>
<tr>
<td>ARTH 469</td>
<td>Collage, Montage, Assemblage</td>
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</table>

### Also Required:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ARTH 400</td>
<td>Senior Seminar</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 410</td>
<td>Museum Practice Seminar I</td>
<td>3</td>
</tr>
</tbody>
</table>

### Art History Electives

Select any two upper-level Art History courses (except ARTH 399):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

### Cognates

Select one studio art course (CAAR):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 201</td>
<td>Beginning Painting</td>
<td></td>
</tr>
<tr>
<td>ART 202</td>
<td>Beginning Drawing</td>
<td></td>
</tr>
<tr>
<td>ART 204</td>
<td>Beginning Watercolor</td>
<td></td>
</tr>
<tr>
<td>ART 206</td>
<td>Basic Design-Color</td>
<td></td>
</tr>
<tr>
<td>ART 210</td>
<td>Beginning Digital Design</td>
<td></td>
</tr>
<tr>
<td>ART 220</td>
<td>Intro to Digital Photography</td>
<td></td>
</tr>
<tr>
<td>ART 306</td>
<td>Intermediate Design-Color</td>
<td></td>
</tr>
<tr>
<td>ART 321</td>
<td>Intermediate Painting</td>
<td></td>
</tr>
<tr>
<td>ART 322</td>
<td>Intermediate Drawing</td>
<td></td>
</tr>
<tr>
<td>ART 323</td>
<td>Figure Drawing</td>
<td></td>
</tr>
<tr>
<td>ART 324</td>
<td>Intermediate Watercolor</td>
<td></td>
</tr>
<tr>
<td>ART 332</td>
<td>Creating the Graphic Novel</td>
<td></td>
</tr>
<tr>
<td>ART 360</td>
<td>Introduction to Printmaking</td>
<td></td>
</tr>
</tbody>
</table>

Select one upper-level course from the following disciplines: ARBC, ART, COMM, ENGL, FREN, GER, GLOC, HIST, HUM, JASS, LING, MCL, MHIS, PHIL, POL, SPAN, SPEE, WGST (excluding POL 494, POL 495, POL 496, POL 497): 3

### Total Credit Hours

33

## Concentration Track B: Museum Studies

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

### Required Courses

Select one course from each of the following four areas: 12

#### Asian/Non-Western (CAAS):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH/HUM 311</td>
<td>Art of China</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 312</td>
<td>Art of Japan</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 313</td>
<td>Chinese Painting</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 315</td>
<td>Early Chinese Art and Culture</td>
<td></td>
</tr>
</tbody>
</table>

## Art History Electives

Select any two upper-level Art History courses (except ARTH 399): 6

### Cognates

Select one studio art course (CAAR):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

Select one upper-level course from the following disciplines: ARBC, ART, COMM, ENGL, FREN, GER, GLOC, HIST, HUM, JASS, LING, MCL, MHIS, PHIL, POL, SPAN, SPEE, WGST (excluding POL 494, POL 495, POL 496, POL 497): 3

### Total Credit Hours

33

## Concentration Track C: Museum Studies

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>ARTH/WGST 416</td>
<td>Earl Mod Jpn Paint &amp; Wood Prnts</td>
<td></td>
</tr>
<tr>
<td>ARTH 319</td>
<td>Egyptian Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 321</td>
<td>Greek Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 322</td>
<td>Roman Art</td>
<td></td>
</tr>
<tr>
<td>ARTH/RELS 327</td>
<td>Gods, Myth and Worship</td>
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</tr>
<tr>
<td>ARTH/RELS 331</td>
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<td>ARTH 322</td>
<td>Early Med and Romanesque Art</td>
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</tr>
<tr>
<td>ARTH 332</td>
<td>Gothic Art and Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 333</td>
<td>The 14th Century</td>
<td></td>
</tr>
<tr>
<td>ARTH/RELS/WH 335</td>
<td>Women in Medieval Art</td>
<td></td>
</tr>
<tr>
<td>ARTH/WGST 425</td>
<td>Women in Classical Antiquity</td>
<td></td>
</tr>
<tr>
<td>ARTH 426</td>
<td>City of Ancient Rome</td>
<td></td>
</tr>
<tr>
<td>ARTH 427</td>
<td>Greek Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 428</td>
<td>Roman Art and Memory</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM 341</td>
<td>Art &amp; Arch in Early Ren Florence</td>
<td></td>
</tr>
<tr>
<td>ARTH 342</td>
<td>Renaissance and Mannerism</td>
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</tr>
<tr>
<td>ARTH 334</td>
<td>Renaissance &amp; Reformation Art</td>
<td></td>
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<tr>
<td>ARTH 336</td>
<td>Italian Renaissance Sculpture</td>
<td></td>
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<tr>
<td>ARTH 351</td>
<td>Southern Baroque Art</td>
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<td>ARTH 352</td>
<td>Northern Baroque Art</td>
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</tr>
<tr>
<td>ARTH/HUM 334</td>
<td>Renaissance &amp; Baroque Rome</td>
<td></td>
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<tr>
<td>ARTH 435</td>
<td>Rembrandt</td>
<td></td>
</tr>
<tr>
<td>ARTH/HUM/ HIST 305</td>
<td>The Arts &amp; Culture of Detroit</td>
<td></td>
</tr>
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<td>ARTH 360</td>
<td>Art of Glass</td>
<td></td>
</tr>
<tr>
<td>ARTH 361</td>
<td>American Art</td>
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</tr>
<tr>
<td>ARTH 362</td>
<td>Impressionism and Post-Impress</td>
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<td>Arts of the Twentieth Century</td>
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</tr>
<tr>
<td>ARTH 364</td>
<td>Picasso</td>
<td></td>
</tr>
<tr>
<td>ARTH 365</td>
<td>Modern Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 366</td>
<td>The Modern Print</td>
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</tr>
<tr>
<td>ARTH 367</td>
<td>Contemporary Art</td>
<td></td>
</tr>
<tr>
<td>ARTH 368</td>
<td>American Photography</td>
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<td>ARTH 375</td>
<td>Urban Design Perspectives</td>
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<td>ARTH 469</td>
<td>Collage, Montage, Assemblage</td>
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<td>ARTH 400</td>
<td>Senior Seminar</td>
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<td>ARTH 410</td>
<td>Museum Practice Seminar I</td>
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<td>ARTH 411</td>
<td>Museum Practice Seminar II</td>
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<tr>
<td>ARTH 399</td>
<td>Cannot be used in the major</td>
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Select one upper-level course from the following: 3
- COMM 360 Social Media for PR
- COMM 420 Critical Media Studies
- COMM 460 Public Relations Campaigns
- JASS/ENGL 330 Feature Writing
- PSYC 4305 Psychology in the Workplace
- OB 354 Behavior in Organization

Total Credit Hours 33

Portfolio Requirement
A portfolio is required for Art History concentration or Museum Studies concentration. The portfolio must be approved by the faculty advisor and will consist of one paper from ARTH 400, one paper from ARTH 410, and one additional paper from another upper level ARTH course taken at UM-Dearborn. Students must also complete an exit interview questionnaire. See the Art History faculty advisor for more details.

Foreign Languages
Although competency in a foreign language is not required for the major, a reading proficiency in French and/or German is extremely important for anyone planning to pursue the study of Art History. Most graduate programs in Art History require at least two foreign languages.

Notes:
1. At least 15 of the 27 upper level hours in ARTH must be elected at UM-Dearborn.
2. ARTH 399 cannot be used in the major.

Minor or Integrative Studies Concentration Requirements
A minor or concentration consists of 12 credit hours of upper-level courses in art history (ARTH).

ARTH 101 Understand Art-Antique to 1400 3 Credit Hours
Full Course Title: Understanding Western Art from Ancient to Medieval-This course asks the question-what does art tell us about the cultures that make it? The course investigates how culture, religion, and social structures manifest themselves in artworks created in the ancient world, for instance in Egypt or Greece, through the dawn of the Renaissance. Students are introduced to the key terms, concepts, and analytical skills that allow us to think critically about the importance of art during this period of time.

ARTH 102 Understanding Art 1400 to Now 3 Credit Hours
Full Course Title: Understanding Western Art from the Renaissance to Now-This course traces the development of European and American art from the revival of classical humanism in the Italian Renaissance toward the rise of consumer culture during the twentieth century. Students explore key works of Western art from Michelangelo to Andy Warhol. Students are introduced to the key terms, concepts, and analytical skills that allow us to think critically about the cultural importance of art from 1400 to the present.
ARTH 103  Arts of Asia  3 Credit Hours
An introduction to the visual arts of three Asian civilizations: India, China, and Japan. Since this is a survey, the focus will be placed on major monuments that are characteristic of these artistic traditions. In order to better understand the works of art, the cultural milieu including religion, philosophy, and parallel arts will be considered. (YR).

ARTH 104  Arts of the Middle East  3 Credit Hours
From the eighth century, a new religious community with no developed artistic heritage spread rapidly over the ancient empires of the near and middle east and as far west as Spain and Hungary. Appropriating established forms and traditions, Muslim cultures created a brilliant system of religious and secular art that reveals national diversity and an underlying unity of purpose. This course provides an introduction to the visual traditions of Muslim cultures. (YR).

ARTH 105  Creation of Art  2 Credit Hours
An art appreciation course based on videotapes. Great art does not completely yield its secrets. The course helps the student to understand the subject, the message or content of the creation and the method that the artist used in making it. This course does not fulfill the Art History concentration requirement. (F,W).

ARTH 106  Architecture & Society  3 Credit Hours
Full Course Title: Architecture & Society in Western Civilization- This course examines how architecture and the built environment both reflect and shape the societies that constructed them. Through a survey of major works of architecture from Antiquity to the present, students will learn about the technical, functional, and aesthetic considerations that determine why buildings look the way they do. Special attention is given to the uses of architecture, engineering innovations, and design choices.

ARTH 221  Ancient Monuments then and Now  3 Credit Hours
This course examines the "biographies" of three iconic ancient architectural monuments: the Great Pyramids of Egypt, the Parthenon in Athens, and the Colosseum in Rome. We will explore the design, engineering, and original functions of these buildings. We will also investigate how people's preceptions of and interactions with these monuments changed over time, up to and including modern tourism. (F,Y,R).

ARTH 241  Encountering the Renaissance  3 Credit Hours
Full Course Title: Encountering the Renaissance: Art, Global Exploration, and Social Reform. This class examines the Renaissance through the study of globalization, science and technology, religious reform, and their impact on the visual arts. Students will learn about such topics as the exploration of Africa, Asia, and the Americas, the invention of the printing press, and the revival Classical Art and humanistic learning. (Y,R).

ARTH 261  Art and Film  3 Credit Hours
Throughout the twentieth-century, painters and sculptors have turned towards the medium of film to make art. This course examines the close relationship between film and visual art when art influences cinema and cinema influences art. Students analyze a movie by a selected filmmaker every week. In addition, concise texts by filmmakers, film historians, and art historians provide context for the development of experimental montage techniques, the relevance of visual art strategies to the art of film, and the discussion of intellectual and societal issues. (O,C).

ARTH 304  Studies in Detroit Culture  3 Credit Hours
This course is an attempt to define a modern cultural history of Detroit. Taught by two faculty members, the emphasis of the course will vary but the following aspects of the city's cultural history will be covered is some detail: its literature, arts, music and architecture; its social conditions and broader American cultural context.

ARTH 305  The Arts & Culture of Detroit  3 Credit Hours
This interdisciplinary course explores the modern and contemporary cultural history of Detroit, examining the ways in which various population groups have been creative from the nineteenth century to the present. The course highlights the work of architects, designers, photographers, visual artists, poets, and musicians, and situates them in the broader cultural context of American art and history.

ARTH 311  Art of China  3 Credit Hours
An introduction to representative works of art produced in China from the Neolithic era down to modern times. Examination of the artifact's cultural context will be emphasized, including the study of philosophy (Confucianism and Daoism) and religion (Buddhism).

ARTH 312  Art of Japan  3 Credit Hours
An introduction to representative works of art produced in Japan from the Neolithic era down to modern times. The artifact’s cultural context will be examined including religious practice (Shinto and Buddhism), influence from abroad, and other artistic developments in literature, music, and theatre.

ARTH 313  Chinese Painting  3 Credit Hours
This course is a survey of the painting of China from the earliest examples found in tombs through works influenced by the West during the modern period. The course focuses on selected artists who serve as representatives of major traditions of China's cultural and artistic heritage. Students will be introduced to Chinese philosophy and relevant literary genres that provide a context for the development of Chinese painting.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 315  Early Chinese Art and Archaeol  3 Credit Hours
An examination of the art and architecture of early China (Neolithic through Eastern Han). Recent excavations that have significantly changed our view of the early period will be given emphasis. Students will analyze relevant literary and philosophical texts in translation to enhance understanding of the cultural context. (O,C).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 319  Egyptian Art  3 Credit Hours
The art of the Ancient world is examined through an intensive review of the visual traditions of Egypt: its monumental architecture, sculpture, painting and decorative artifacts. (A,Y).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 321  Greek Art  3 Credit Hours
This course surveys the history and art of Crete, the Cyclades, and Greece from the third millennium through the first century B.C. In the prehistoric period, the course will focus on both architectural and ceramic developments, as well as on the trade and economic contacts between Asia Minor and Greece. In the historic period, the course considers the major artistic developments in architecture, sculpture, and painting, focusing on how social, political or historical events caused these art forms to evolve and change over the centuries. (A,Y).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
ARTH 106  Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 332  Roman Art  3 Credit Hours
This course surveys the major art forms produced by both the Romans and Etruscans. The course begins with the Roman Republic (late sixth century B.C.) and concludes with the rule of Constantine in the fourth century A.D.). We will discuss the development of the urban, government complex (the Roman Forum), the evolution of domestic architecture, and the major artistic achievements in sculpture, painting, and the minor arts. We will focus on how social, economic, religious, political and/or historical events caused these art forms to evolve and change over the centuries. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 337  Gods, Myth and Worship  3 Credit Hours
Full Course Title: Gods, Myth and Worship in Classical Art- This course examines the way that gods, goddesses, heroes, and myths are depicted in Greek and Roman art, and how they were central to the religious and cultural life of these civilizations. We study the art, architecture, literature, and archaeology of ancient Greece and Rome as we explore how religious priorities, social needs, and political ideologies shaped the artistic choices behind the representations of deities and legendary figures and stories.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 105

ARTH 331  Early Christian Byzant Art  3 Credit Hours
Borrowing its formal language from late antiquity and its symbolism from other mystery cults, the art of early Christianity emerged from the Roman catacombs to monumental expression under emperors Constantine and Justinian. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 332  Early Med and Romanesque Art  3 Credit Hours
A study of the dynamic interplay between barbarian, Christian and classical Mediterranean influences in the early Medieval period with a consideration of the art and architecture of the pilgrimage routes to Santiago de Compostela and of the crusader kingdoms in the Holy Land. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 333  Gothic Art and Architecture  3 Credit Hours
A survey of the architecture, sculpture and stained glass of the great cathedrals of Europe, focusing on Chartres, Amiens, Reims, and Bourges. A study of the patrons, builders, the new technology they employed and the cities in which they worked as well as an analysis of the emergence of naturalism in medieval manuscript illumination and panel painting. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 334  The 14th Century  3 Credit Hours
This is a course that examines the art and architecture of Europe in the 14th century: one of the great transitional periods in the history of western art. Beginning with the new developments in 13th-century Italian art by such artists as Giovanni Pisano and Giotto, the course charts the pattern of these developments in northern European countries as well. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 335  Women in Medieval Art  3 Credit Hours
Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women's roles in the creation and patronage of art and literature, economic and family issues, and women's participation in new and innovative forms of religious piety.

ARTH 341  Art & Arch in Early Ren Florence  3 Credit Hours
This course examines the city of Florence as a work of art, as well as masterpieces of Florentine sculpture, painting and architecture of the Early Renaissance (fifteenth century). Among the masters studied are the sculptors Nanni di Banco, Donatello, Ghiberti, Luca della Robbia, Polliauolo, and Verrocchio; the painters Masaccio, Fra Angelico, Fra Filippo Lippi, and Botticelli; and the architects Brunellschi, and Alberti. Statuary, reliefs and tombs; altarpieces, fresco cycles and mythological pictures; churches and palaces are all studied within the context of the technical, philosophical, political and cultural developments of the quattrocento. The ideals of the Florentine Republic, Humanism, Neo-Platonism, and Millenarianism provide the historical and intellectual background for the study of these works of art and architecture. Issues of patronage, placement, restoration, art criticism, women's roles in society and reception will also be explored. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103

ARTH 342  High Renaissance and Mannerism  3 Credit Hours
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 343  Renaissance & Reformation Art  3 Credit Hours
Full Course Title: Renaissance & Reformation Art in Northern European Art- This course surveys the religious and political forces that shaped art produced north of the Alps during the fifteenth and sixteenth centuries. Through the study of artworks by such masters as Van Eyck, Durer, and Bruegel, students examine the connections between art and devotional practices, the rise of secular imagery and humanism, and the impact of the art of Italy. Special attention is also given to the role that art played during the Protestant Reformation and to the development of printmaking.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 344  Italian Renaissance Sculpture  3 Credit Hours
A study of freestanding and relief sculpture during the Italian Renaissance, with particular attention to major artistic centers like Florence, Rome, and Venice in the 15th and 16th centuries. By examining such forms as colossal statuary, equestrian sculpture, tomb monuments, garden sculpture, and portrait busts, the course will address the function of art within the public sphere, the relationship between civic sculpture and political ideology, the re-elevation of sculpture from a mechanical art to a liberal art, and the role artistic individuality and technical proficiency. Artists addressed will include Donatello, Ghiberti, Verrocchio, Antico, Riccio, Bertoldo, Michelangelo, Cellini, and Giambologna.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
ARTH 351  Southern Baroque Art  3 Credit Hours
A study of the art of the seventeenth century in Italy and Spain, focusing upon Caravaggio, Annibale Carracci, Guercino, Reni, Cortona, Gaulli, Murillo, Zurbaran, and Velasquez, among others. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 352  Northern Baroque Art  3 Credit Hours
Study of the art of the seventeenth century in France, Flanders and Holland, with emphasis on Poussin, Georges de la Tour, the Le Nain brothers, Lebrun, Rubens, Van Dyck, Van Ruisdael, Vermeer, and Rembrandt. (OC).

ARTH 360  Art of Glass  3 Credit Hours
This course focuses on glass as a medium and an art form. From Roman times to the present day, the unique qualities of glass have excited artists and craftsmen to make vessels, sculptures, and architectural ornamentation. The course traces the form and function of glassworks, focusing particularly on the historical trajectory of glass from ancient vessels and medieval stained glass, to the development of "art glass" in the nineteenth century, to contemporary objects. The course is based on lectures, discussion, and readings. Students are required to attend several field trips for "hands-on" work with objects. Enrollment is limited to 15 students.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 361  American Art  3 Credit Hours
A study of American painting, sculpture, and architecture from the colonial period to the present. In this survey of an arts tradition that has greatly depended upon developments in Europe, efforts will be made to identify what is American about American art. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 362  Impressionism and Post-Impression  3 Credit Hours
An examination of the origins of modern painting and sculpture in the art of the major Impressionists (Manet, Monet, Degas, Renoir) and Post-Impressionists (Cezanne, Seurat, Gauguin, Van Gogh). (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 363  Arts of the Twentieth Century  3 Credit Hours
A contextual study of twentieth-century art that seeks to define the relationships between western art and society. In addition to a consideration of painting, sculpture, and architecture, the emergence of new media - including altered and fabricated photography, video, and installation art - will be examined. Although a broad survey of a century rich in artistic achievements, the course will emphasize the dominance and influence of Pablo Picasso, Henri Matisse, and Frank Lloyd Wright. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 364  Picasso  3 Credit Hours
A critical examination of Pablo Picasso's art that chronicles the artist's achievements as a painter, sculptor, draftsman, printmaker, and ceramist. Lectures and readings are directed to positioning Picasso's masterworks in relationship to his art as a whole and in the context of twentieth-century art. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 365  Modern Architecture  3 Credit Hours
A survey of European and American architecture from the Chicago School to Post-Modernism. The course will trace the stylistic history of modern architecture while considering parallel issues of theory, social context, and building technology. Major architects studied will be Sullivan, Wright, Mies van der Rohe, Le Corbusier, and Johnson. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 366  The Modern Print  3 Credit Hours
A history of western printmaking from Post-Impressionism to the present. The course will examine the relationship of printmaking to major movements of the day, the impact of modern technology on traditional print processes, and the development of printmaking as an integral form of expression for the modern painter and sculptor. Special emphasis will be placed on the contributions of Gauguin, Munch, Picasso, Johns, and Stella. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 367  Contemporary Art  3 Credit Hours
An examination of the most recent developments in modern art. In addition to painting and sculpture, consideration will be given to related forms of expression in performance art, photography, and video. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 368  American Photography  3 Credit Hours
This course explores the history of photography, its aesthetics, and social functions in the United States, beginning with the medium's emergence in the 1830s and concluding with contemporary practices. Lectures and discussions will attend to several threads of inquiry: the history and theory of the medium and its interpretation; the diverse functions of photographs in American society; the relationship between photography and American identity formation; and the status of the photograph in a post-photographic, digital age. (OC)

ARTH 375  Urban Design Perspectives  3 Credit Hours
This course explores the ways in which urban design both creates and reflects past and present urban conditions, cultures, and spatial relationships. The course will look at the built environment architecturally, aesthetically, and anthropologically in order to highlight the ever changing complexities of urban spheres. The placement and design of buildings and public spaces, and the resulting human interactions in those spaces, will be explored in comparative contexts.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTH 384  Islamic Architecture  3 Credit Hours
This course is a comprehensive study of history and development of Islamic architecture from its birth in the seventh century to the present time. The course is designed to explain major characteristics of Islamic architecture through the study and analysis of major monumental buildings both religious and secular: Mosques, Madrasas (schools), Mausoleums, Palaces, and other buildings. Detailed analysis also will be applied to different types of art associated with these buildings, such as wall painting, stucco work, wood carving, sculpture, mosaic, and calligraphy.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 105
Restriction(s):
Can enroll if Level is Undergraduate
ARTh 385  Islamic Decorative Arts  3 Credit Hours
This course is an in-depth investigation of the decorative arts of the Islamic Middle East from the seventh through the eighteenth century including the lands of Islamic Spain and North Africa and extending east to Afghanistan. The course traces the development of decorative styles in objects of daily and courtly life, particularly ceramics, metal work, glass, wood and ivory carving, textiles and rugs. The central role played by calligraphy in all of the arts is emphasized as well as in manuscript production and the Arts of the Book. As a religion, but also a way of life, Islam fostered a distinctive artistic production reflected in these decorative arts.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106 or RELS 201

ARTh 390  Topics in Art History  3 Credit Hours
Examination of problems and issues in selected areas of art history. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when topics differ. (OC).

ARTh 399  Independent Studies  1 to 3 Credit Hours
Readings and research assignments in history of art selected in accordance with the special needs and interests of art history concentrators. May be repeated for a maximum of 6 credit hours. (FW).

ARTh 400  Senior Seminar  3 Credit Hours
An introduction to art-historical research methods. The art historian's central task of interpretation is explored by considering the critical perspectives of connoisseurship, iconography, formal analysis, iconology, and modern literary theory. (OC).
Prerequisite(s): (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 399 or ARTH 400 or ARTH 409 or ARTH 410 or ARTH 411 or ARTH 412 or ARTH 413 or ARTH 414 or ARTH 415) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 412 or ARTH 425 or ARTH 426 or ARTH 445) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 425 or ARTH 426 or ARTH 445) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 425 or ARTH 426 or ARTH 445)

ARTh 410  Museum Practice Seminar I  3 Credit Hours
Students conduct research on works of art in preparation for an exhibition and an accompanying catalogue. Students are exposed to all aspects of writing a catalogue and didactic texts, designing/installing the exhibition, and planning the exhibition opening.
Prerequisite(s): (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 400 or ARTH 411 or ARTH 425) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 425 or ARTH 426 or ARTH 445) and (ARTH 304 or ARTH 305 or ARTH 310 or ARTH 311 or ARTH 312 or ARTH 313 or ARTH 315 or ARTH 319 or ARTH 321 or ARTH 322 or ARTH 331 or ARTH 332 or ARTH 333 or ARTH 334 or ARTH 342 or ARTH 343 or ARTH 346 or ARTH 351 or ARTH 352 or ARTH 361 or ARTH 362 or ARTH 363 or ARTH 364 or ARTH 365 or ARTH 366 or ARTH 367 or ARTH 370 or ARTH 390 or ARTH 392 or ARTH 410 or ARTH 411 or ARTH 425 or ARTH 426 or ARTH 445)

ARTh 411  Museum Practice Seminar II  3 Credit Hours
This course is an introduction to museum studies. Students explore the history and missions of museums, and the role of museums in shaping public discourses on art. They also study current issues related to museum practice, including collection development, repatriation of cultural property, conservation, administration, research, exhibition and interpretation. Field trips to area institutions are scheduled so students can meet museum and gallery professionals in order to consider career opportunities available in this context.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTh 416  Earl Mod Jpn Paint&Wood Prnts  3 Credit Hours
Paintings and woodblock prints of the Edo/Tokugawa (1600-1868) and Meiji (1868-1912) periods are considered in light of competing developments that on the one hand looked to Japan's classical tradition and on the other to the influence of art and artists from China and the West. Special attention is given to female artists and images of women. Students cannot receive credit for both ARTH 416 and ARTH 516. (OC).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103
Restriction(s): Cannot enroll if Class is Graduate

ARTh 425  Women in Classical Antiquity  3 Credit Hours
This course examines the evidence for the lives of women in Greek, Etruscan and Roman Antiquity, from the Bronze Age through the Imperial Period. Special emphasis will be placed on the archaeological evidence, especially works of art which illustrate women's lives and their relationships with men. Documents such as dedicatory and funerary inscriptions, the poetry of Sappho and Sulpicia, and selections from the works of Homer, Hesiod, Aristotle, Pliny, Juvenal, and other ancient authors, will also be examined critically, particularly in relationship to the works of art. Students cannot receive credit for both ARTH 425 and ARTH 525. (YR).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s): Cannot enroll if Class is Graduate

ARTh 426  City of Ancient Rome  3 Credit Hours
This course will focus on the ancient city of Rome, from its foundation to its precipitous decline in the fifth century AD. It will explore the public art and architecture of the city, emphasizing the different types of evidence available (topography, architecture, sculpture, texts) for understanding the history, politics, religion, and urban development of Rome, as well as the various art historical and archaeological techniques used to analyze the evidence. (OC)
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103
ARTh 427 Greek Architecture  3 Credit Hours
The architectural vocabulary established during the centuries of classical Greek civilization influences our culture to the present day. This course explores the history and development of this fundamental architectural tradition, focusing on the Greek temple, sanctuaries and holy sites, urban planning and public works, and domestic space. Students discuss the philosophical underpinnings of Greek architectural design, the engineering practices of Greek builders, as well as the cultural and social influences on Greek buildings and cities. This course begins with the emergence of humble mudbrick and timber buildings from the Dark Ages and continues through the height of cosmopolitan urban luxury in the 2nd century AD.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Can enroll if Level is Undergraduate

ARTh 428 Roman Art and Memory  3 Credit Hours
In this course, we examine Roman art closely associated with personal commemoration and cultural memory, including portraiture, funerary monuments, imperial monuments, and public architecture. We explore these objects’ relationship to Roman literary culture’s theories of mnemotechnics, and in the social context of the Roman obsession with memory perpetuation. We also examine how art historians apply modern theories of collective and social memory in their scholarship on Roman art, creating new ways of understanding Roman sculpture, painting, and architecture. Finally, we investigate Roman spectacle and performance as a vehicle of cultural memory. Students cannot earn credit for both ARTH 428 and ARTH/LIBS 528.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Can enroll if Level is Undergraduate

ARTh 434 Renaissance and Baroque Rome  3 Credit Hours
The return of the papacy in 1420 initiated the reemergence of Rome as a major cultural center. This course examines painting, sculpture, architecture, and urban planning in Rome from the 15th to the 17th century, including the work of Raphael, Michelangelo, Bernini, Borromini, and Caravaggio. Topics to be explored include the birth of Renaissance archaeology and antiquarianism; humanism and the papal curia; urban renewal and conservation; pilgrimage and sacred topography; the “myth of Rome”, architecture of churches, villas, and palaces; tourism and the city as spectacle. This course is structured as a seminar that is writing and research-intensive.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

ARTh 454 Rembrandt  3 Credit Hours
Rembrandt’s paintings, drawings, and prints are considered in the full historical and cultural context of the Golden Age of the Northern Netherlands, a period of unprecedented wealth and cultural diversity. Special attention will be given to issues of style, iconography, biography, art criticism, gender, patronage and artistic technique. Students cannot receive credit for both ARTH 454 and ARTH 554. (YR).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Cannot enroll if Class is Graduate

ARTh 469 Collage, Montage, Assemblage  3 Credit Hours
Different conceptions of collage, montage, and assemblage have vitally shaped artistic practice in the twentieth century, perhaps even more so than the advent of modernist abstraction. The modern phenomenon of collecting, mixing, and sampling that permeates the last century up to and including the contemporary moment will be traced in the class across the thresholds of painting, sculpture, architecture, photography, and film. We will discuss a wide range of movements, genres, and styles (Cubism, Futurism, Surrealism, Dada, Weimar and Russian photomontage, Soviet film, found footage film, French decollage, postwar assemblage) and their relation to the ever-changing mass media, the urban, and the modernized - in short, the everyday. The last segment of the class addressed more recent interpretations of the collage paradigm, including installation art and digital applications. Student cannot receive credit for both ARTH 469 and ARTH 569.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Astronomy
The minor/concentration in Astronomy helps prepare students for entry into the competitive science, technology, engineering, and mathematics (STEM) workplace. Students gain exposure to the principles of astronomy, physics, and mathematics. They learn to think critically and evaluate, interpret, and solve problems related to astronomical, as well as other technical and general scientific topics.

Minor or Integrative Studies
Concentration Requirements
A minor or concentration consists of 12 credit hours of upper-level courses from the following:

Gateway courses: Three (3) to six (6) credit hours from 300 level ASTR or PHYS 305.

Advanced courses: Six (6) to nine (9) credit hours from 400 level ASTR including up to 3 credit hours in independent study or directed research, ASTR 498 and/or ASTR 499 may be applied to the completion of the minor or concentration.

ASTR 130 Introduction to Astronomy  3 Credit Hours
A one-term introduction for those interested in learning about the present state of knowledge of the Universe, its origin, evolution, organization, and ultimate fate. Exciting new discoveries concerning extrasolar planets, star birth, supermassive black holes, dark matter/dark energy, and cosmology are discussed. Two years of high school math or its equivalent recommended.
ASTR 131 Introductory Astronomy Lab 1 Credit Hour
An introduction to some of the important observational techniques and analytical methods used by astronomers. Ground-based and satellite data will be used to reveal physical and chemical properties of the moon, planets, stars, and the Milky Way. Outdoor exercises involving telescopic observation of the sun, variable stars, nebulae, and external galaxies are also included. Constellation identification will be taught using off-campus planetarium facilities.
Prerequisite(s): ASTR 130* or PHYS 130

ASTR 133 Search for Life in Universe 3 Credit Hours
Full Title: The Search for Life in the Universe A one-semester course on the scientific search for life throughout the Universe. The range of environments hospitable for life form an organizing principle by which to examine several aspects of modern Astronomy including, but not limited to: habitats in the Solar System; physical constraints on life and unusual chemistry; the Search for Extraterrestrial Intelligence and the Fermi Paradox. (F)

ASTR 301 Astrophysical Concepts 3 Credit Hours
A one-semester course introducing the Physical concepts used in Modern Astrophysics, with an emphasis on the application of these ideas to Astrophysical objects. The course familiarizes the student with the Astronomical concepts and vocabulary used in other Astronomy courses at the 300-level and beyond. The course begins with an overview of Astronomical objects and terminology, before introducing conservation laws in Physics and their applications in Astronomy. Newtonian mechanics and gravity are then introduced and applied to various self-gravitating systems and scenarios. Electromagnetism, Quantum Mechanics and a small amount of Statistical Physics are covered at sufficient detail to understand the behavior of electromagnetic radiation and thermal emission. Special and General relativity are introduced from the point of view of understanding the behaviors of certain exotic objects in Astronomy. Common statistical distributions used in upper-level Astronomy courses are also introduced with an emphasis on application.
Prerequisite(s): (MATH 114 or MATH 116) and (PHYS 126 or PHYS 151)
Restriction(s):
Can enroll if Level is Graduate or Undergraduate
Can enroll if College is Education, Health, and Human Services or Arts, Sciences, and Letters or Business or Engineering and Computer Science

ASTR 330 The Cosmic Distance Scale 3 Credit Hours
An exploration of the cosmic distance ladder focusing on the systems and techniques that astronomers use in establishing the distances to celestial objects. Direct measures using radar ranging and trigonometric parallax will be discussed for objects in the solar system and for stars within about 3000 light-years of the Sun, respectively. For more remote systems in or just outside the Milky Way, methods based spectroscopic parallax and the period-luminosity relation for various types of variable stars will be introduced. For the extra-galactic objects, use of the Hubble relation and the light curves of Type Ia supernovae will be made to assess the distances. At each rung of the ladder, emphasis will be placed on the astrophysical principles and processes underlying the methodology being applied. 3 hours lecture
Prerequisite(s): (MATH 113 or MATH 115) and (PHYS 126 or PHYS 151)

ASTR 361 Observational Techniques 3 Credit Hours
This course is designed to provide students with an understanding of some of the basic observational techniques use by astronomers in gathering and analyzing data from celestial objects. Practical experience in acquiring, displaying, and interpreting optical and radio observations using the University’s 0.4-m telescope and 2.3-m radio dish will be emphasized. Topics will include astronomical coordinate system and timekeeping, telescope optics, the design and use of CCD detectors, fundamentals of multi-color photometry, an introduction to astronomical spectroscopy, and radio measurements of the Sun and interstellar hydrogen clouds at 21-cm wavelengths. (2 hours lecture, 3 hours laboratory)
Prerequisite(s): (ASTR 130 or PHYS 130) and (PHYS 126 or PHYS 151)

ASTR 390 Topics in Astronomy 3 Credit Hours
A lecture in a topic of current interest in astronomy. Topics vary and are announced in the current Schedule of Classes. Three hours lecture.
Prerequisite(s): ASTR 130 or PHYS 130

ASTR 390A Topics in Astronomy 3 Credit Hours
Topic: Dark Matter, Dark Energy, Dark Future? An Introduction to 21st Century Cosmology. Modern cosmology, buttressed by increasingly precise observational data provided by space missions like HST, COBE, and WMAP, teaches that the universe is composed primarily of matter we cannot see nor properly characterize, the so-called 'dark matter,' and of energy whose source is unknown and may defy knowing, the ubiquitous 'dark energy.' This course will attempt to elucidate what we currently understand about the composition, structure and evolution of the universe based on general relativistic theory and astronomical observations of remote galaxies using both ground- and space-based technologies. Special attention will be given to the means by which important cosmological parameters that determine the structure of the universe, like the critical density, the Hubble parameter, and the curvature and cosmological constants, are established. If time permits, additional consideration will be given to the array of planned future space missions devoted to cosmology-related subjects.
Prerequisite(s): PHYS 305

ASTR 421 Stellar Astrophysics 3 Credit Hours
An application of important physical principles to stars and star clusters. Topics will include gravitational collapse and star formation, radiative transfer and stellar atmospheres, nucleosynthesis and the structure of normal stars, degeneracy and the endpoints of stellar evolution, and general relativistic effects in the vicinity of black holes. 3 hour lecture.
Prerequisite(s): (PHYS 305 or ASTR 301 or ASTR 330) and (MATH 205 or MATH 215)

ASTR 445 Galaxies and Cosmology 3 Credit Hours
A course devoted to our current understanding of the composition, structure, and evolution of the universe based on general relativistic theory and astronomical observations of remote galaxies using both ground- and space-based technologies. Topics include observational characteristics, classification, kinematics and evolution of galaxies, quasars and active galactic nuclei, the cosmic microwave background radiation, concepts of general relativity, single- and multi-component models of the universe, dark matter and dark energy, and the origin of the universe (the big bang, inflation and the creation of the first elements). Three hours lecture. (AY)
Prerequisite(s): (PHYS 305 or ASTR 301 or ASTR 330) and (MATH 114 or MATH 116)

ASTR 498 Directed Studies in Astronomy 1 to 3 Credit Hours
Special topics in astronomy chosen by mutual agreement between the student and the instructor. Course may be repeated for credit. (F, W, S)
**Behavioral and Biological Sciences**

The study of Behavioral and Biological Sciences investigates the intersections between biochemistry, psychology, genetics, neurobiology, behavior, immunology and anthropology. Students choosing the Bachelor of Arts, or Bachelor of Science, in Behavioral and Biological Sciences will learn the foundations of both biological and psychological sciences as they apply to the study of human and animal behavior, as well as ethical considerations and implications of research. The student experience will include a selection of lectures and laboratory courses to develop foundational understanding, hands-on experimental understanding and critical thinking skills. Students trained in these areas will be prepared for business and research positions, for pursuing advanced degrees in medical school, pharmacy or graduate programs and will contribute in the following areas:

- Health and wellness, making a direct and significant impact in areas in which citizens have received “poor marks.”
- Health and the environment, indirectly, by working in research and within industry to change manufacturing processes and improve products.
- Leadership in business, industry and politics.
- K-12 education through service learning and outreach.

Please visit the Behavioral and Biological Sciences (https://umdearborn.edu/casl/undergraduate-programs/areas-study/behavioral-biological-sciences/) webpage for more information.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>MCL 105</td>
<td>Ancient Greek I</td>
<td>3</td>
</tr>
<tr>
<td>MCL 106</td>
<td>and II</td>
<td></td>
</tr>
<tr>
<td>ARBC 101</td>
<td>Arabic I and II</td>
<td>3</td>
</tr>
<tr>
<td>ARBC 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCL 111</td>
<td>Armenian I and II</td>
<td>3</td>
</tr>
<tr>
<td>MCL 112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHIN 101</td>
<td>Chinese I and II</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREN 101</td>
<td>French I and II</td>
<td>3</td>
</tr>
<tr>
<td>FREN 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GER 101</td>
<td>German I and II</td>
<td>4</td>
</tr>
<tr>
<td>GER 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAT 101</td>
<td>Latin I and II</td>
<td>3</td>
</tr>
<tr>
<td>LAT 102</td>
<td></td>
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<tr>
<td>SPAN 101</td>
<td>Spanish I and II</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 102</td>
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</tbody>
</table>

**Prerequisites to the Major**

Not counted in the minimum 40 credit hours required for the major.
**Major Requirements**

Minimum of 40 credit hours upper level required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOCHEMISTRY</td>
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<tr>
<td>BCHM/BIOL/ CHEM 370</td>
<td>Principles of Biochemistry</td>
<td></td>
</tr>
<tr>
<td>OR BCHM 470 and BCHM 471</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENETICS: One class from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 301</td>
<td>Cell Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 306</td>
<td>General Genetics</td>
<td></td>
</tr>
<tr>
<td>BIOL/BCHM 474</td>
<td>Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>NEUROSCIENCE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 350</td>
<td>Introduction to Neurobiology</td>
<td></td>
</tr>
<tr>
<td>BIOLOGY &amp; EVOLUTION: One class from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 331</td>
<td>Human Evolution</td>
<td></td>
</tr>
<tr>
<td>BIOL 419</td>
<td>Behavior and Evolution</td>
<td></td>
</tr>
<tr>
<td>BIOL 491</td>
<td>Capstone Course in Biology</td>
<td></td>
</tr>
<tr>
<td>ANIMAL BEHAVIOR: One class from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 336</td>
<td>Introduction to Primates</td>
<td></td>
</tr>
<tr>
<td>BIOL 353</td>
<td>Ornithology</td>
<td></td>
</tr>
<tr>
<td>BIOL 456</td>
<td>Behavioral Biology</td>
<td></td>
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<tr>
<td>PSYC 372</td>
<td>Animal Behavior</td>
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<tr>
<td>PSYC 474</td>
<td>Animal Learning and Cognition</td>
<td></td>
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<tr>
<td>PSYC 488</td>
<td>Primatology Field Course</td>
<td></td>
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<tr>
<td>PHYSIOLOGICAL PSYCHOLOGY: One class from:</td>
<td></td>
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</tr>
<tr>
<td>BIOL 357</td>
<td>Human Physiology</td>
<td></td>
</tr>
<tr>
<td>PSYC 370</td>
<td>Physiological Psychology</td>
<td></td>
</tr>
<tr>
<td>SENSATION &amp; PERCEPTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYC 463</td>
<td>Sensation and Perception</td>
<td></td>
</tr>
<tr>
<td>COGNITION/LANGUAGE DEVELOPMENT: One class from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYC 363</td>
<td>Cognitive Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC/LING 375</td>
<td>Psychology of Language</td>
<td></td>
</tr>
<tr>
<td>PSYC 461</td>
<td>Learning and Memory</td>
<td></td>
</tr>
<tr>
<td>EPIDEMIOLOGY/HEALTH PSYCHOLOGY: One class from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL/MICR 380</td>
<td>Epidemiology</td>
<td></td>
</tr>
<tr>
<td>HPS 412</td>
<td>Principles of Epidemiology</td>
<td></td>
</tr>
<tr>
<td>PSYC 455</td>
<td>Health Psychology</td>
<td></td>
</tr>
<tr>
<td>ETHICS IN RESEARCH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BBS 451</td>
<td>Ethics in Research</td>
<td></td>
</tr>
<tr>
<td>STATISTICS: One class from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYC 381</td>
<td>Prin of Stat and Exper Design</td>
<td></td>
</tr>
<tr>
<td>STAT 301</td>
<td>Biostatistics I</td>
<td></td>
</tr>
<tr>
<td>EXPERIMENTAL PSYCHOLOGY:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYC 465</td>
<td>Experimental Psychology</td>
<td></td>
</tr>
<tr>
<td>COMPUTER IN PSYCHOLOGY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYC 481</td>
<td>Computers in Psychological Res</td>
<td></td>
</tr>
</tbody>
</table>

**CAPSTONE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBS 490</td>
<td>Bio and Beh Science Capstone</td>
</tr>
</tbody>
</table>

**NOTE:**

At least 21 of the 40 upper level credit hours must be elected at UM-Dearborn.

**Behavioral Sciences**

The major in Behavioral Sciences is an interdisciplinary program encompassing the disciplines of anthropology, psychology, and sociology. It is designed as a general preparation for a career in human services such as social work, counseling, criminology, or prevention/treatment programs in mental health.

The idea for combining the three fields is based on the belief that it is important for an individual who plans to work with people to understand human beings as individuals (psychologically) who function in groups (social psychologically) within a social context (sociologically) which varies across cultures (anthropologically).

It is also critical to have some exposure to the methods employed by behavioral scientists and some actual experience in the working world of the human services.

The Behavioral Sciences major requires the student to take three introductory-level behavioral sciences courses: Anthropology 101, Psychology 101, and Sociology 200 or 201. A minimum of 30 upper-division (300 and above) credits in the Behavioral Sciences, including at least two courses in psychology, two in sociology, and one in anthropology, is required, as is six credit hours of upper-level coursework in cognate areas outside of the behavioral sciences.

The Behavioral Sciences major encourages specific vocational tracks shaped to the student's career goals. Faculty members in Behavioral Sciences are available to advise the student on careers and appropriate course selection.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)
Critical and Creative Thinking (GECC) – 3 Credits

Areas of Inquiry

Natural Science (GENS) – 7 Credits

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits

Humanities and the Arts (GEHA) – 6 Credits

Intersections (GEIN) – 6 Credits

Capstone

Capstone (GECE) – 3 Credits

Foreign Language Requirement

Complete a two-semester beginning language sequence.

- Ancient Greek I and II  MCL 105 and MCL 106
- Arabic I and II  ARBC 101 and ARBC 102
- Armenian I and II  MCL 111 and MCL 112
- Chinese I and II  CHIN 101 and CHIN 102
- French I and II  FREN 101 and FREN 102
- German I and II  GER 101 and GER 102
- Latin I and II  LAT 101 and LAT 102
- Spanish I and II  SPAN 101 and SPAN 102

Prerequisites to the Major

The major requires the student to take three introductory courses, one in each of the primary disciplines:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ANTH 101</td>
<td>Introduction to Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>or ANTH 202</td>
<td>World Cultures</td>
<td></td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology (PSYC 170 or</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PSYC 171 prior to Fall 2014)</td>
<td></td>
</tr>
<tr>
<td>SOC 200</td>
<td>Understanding Society</td>
<td>3</td>
</tr>
<tr>
<td>or SOC 201</td>
<td>Contemporary Social Problems</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours

9

Major Requirements

The major also requires a minimum of 39 upper-level (300/400; 3000/4000 level) credits in the Behavioral Sciences as outlined below, including at least three courses in psychology (PSYC), three in sociology (SOC), and two in anthropology (ANTH).

Methods (CABM): Select one course from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH 470</td>
<td>Doing Anthropology</td>
</tr>
<tr>
<td>PSYC 415</td>
<td>Lab in Developmental Psych</td>
</tr>
<tr>
<td>PSYC/CRJ 425</td>
<td>Lab in Social Psychology</td>
</tr>
<tr>
<td>PSYC 4445</td>
<td>Personality Assessment Lab</td>
</tr>
<tr>
<td>SOC/CRJ/HHS 410</td>
<td>Quantitative Research</td>
</tr>
<tr>
<td>SOC 411</td>
<td>Program Evaluation</td>
</tr>
<tr>
<td>SOC 413</td>
<td>Qualitative Research</td>
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</table>

Normal/Abnormal Personality (CAN): Select one course from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH 482</td>
<td>Psychological Anthropology</td>
</tr>
<tr>
<td>PSYC/CRJ 440</td>
<td>Abnormal Psychology</td>
</tr>
<tr>
<td>PSYC 441</td>
<td>Intro to Clinical Psychology</td>
</tr>
<tr>
<td>PSYC 442</td>
<td>Child Psychopathology</td>
</tr>
<tr>
<td>PSYC 450</td>
<td>Personality Theory</td>
</tr>
<tr>
<td>SOC/CRJ 465</td>
<td>Deviant Behavior/Soc Disorganz</td>
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</tbody>
</table>

Human Development (CAHD): Select one course from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH/NSCI 415</td>
<td>Nutrition and Health</td>
</tr>
<tr>
<td>PSYC 300</td>
<td>Life-Span Developmental Psych</td>
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<tr>
<td>PSYC 301</td>
<td>Psych of Infant Development</td>
</tr>
<tr>
<td>PSYC 302</td>
<td>Psych of Child Development</td>
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<tr>
<td>PSYC 315</td>
<td>Personality Development</td>
</tr>
<tr>
<td>PSYC/CRJ 407</td>
<td>Psychology of Adolescence</td>
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<tr>
<td>PSYC 412</td>
<td>Psychology of Aging</td>
</tr>
<tr>
<td>SOC 426</td>
<td>Society and Aging</td>
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<tr>
<td>SOC 445</td>
<td>The Family</td>
</tr>
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</table>

Health/Biological (CABH): Select one course from:

<table>
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<tr>
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<th>Title</th>
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<tr>
<td>ANTH 325/ ENST 326</td>
<td>Anth of Health and Environment</td>
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<tr>
<td>ANTH/STS 409</td>
<td>Human Body, Growth &amp; Health</td>
</tr>
<tr>
<td>ANTH/STS 430</td>
<td>Medical Anthropology</td>
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<tr>
<td>ANTH 435</td>
<td>Human Genetics</td>
</tr>
<tr>
<td>ANTH 459</td>
<td>Human Osteology</td>
</tr>
<tr>
<td>HHS 336</td>
<td>Perspectives in Women's Health</td>
</tr>
<tr>
<td>HHS 412</td>
<td>Principles of Epidemiology</td>
</tr>
<tr>
<td>HHS 430</td>
<td>Hlth Behavior &amp; Hlth Education</td>
</tr>
<tr>
<td>HHS 435</td>
<td>Obesity and the Lifecourse</td>
</tr>
<tr>
<td>PSYC 446</td>
<td>Human Sexual Behavior</td>
</tr>
<tr>
<td>PSYC 455</td>
<td>Health Psychology</td>
</tr>
<tr>
<td>SOC/HHS 440</td>
<td>Medical Sociology</td>
</tr>
</tbody>
</table>

Gender (CAGR): Select one course from:

| Code      | Title                                   |
ANTH/HUM/PSYC/SOC/WGST 303
ANTH/CRJ/SOC/WGST 412
ANTH/COMM/SOC/WGST 481
HHS 336
PSYC 405/CRJ 443/SOC 443/WGST 405
SOC/HUM/WGST 366
SOC/HUM/WGST 409
SOC/CRJ/WGST 461

**Social Class/Economics (CACE): Select one course from:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 376</td>
<td>Power &amp; Privilege in SE Mich</td>
</tr>
<tr>
<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
</tr>
<tr>
<td>SOC/CRJ 423</td>
<td>American Social Classes</td>
</tr>
<tr>
<td>SOC/CRJ 435</td>
<td>Urban Sociology</td>
</tr>
<tr>
<td>SOC 450</td>
<td>Political Sociology</td>
</tr>
<tr>
<td>SOC 477</td>
<td>Social Welfare</td>
</tr>
</tbody>
</table>

**Race/Ethnicity/Culture (CARE): Select one course from:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH/AAAS/STS 340</td>
<td>Race and Evolution</td>
</tr>
<tr>
<td>ANTH 370</td>
<td>Indians of North America</td>
</tr>
<tr>
<td>ANTH/AAAS 371</td>
<td>African Exper in the Americas</td>
</tr>
<tr>
<td>ANTH 372</td>
<td>Anthropology of Latin America</td>
</tr>
<tr>
<td>ANTH 373</td>
<td>Anth Persp on the Middle East</td>
</tr>
<tr>
<td>ANTH/WGST 420</td>
<td>Kinship and Marriage</td>
</tr>
<tr>
<td>ANTH 421</td>
<td>Education and Culture</td>
</tr>
<tr>
<td>ANTH/LING 425</td>
<td>Language and Society</td>
</tr>
<tr>
<td>ANTH/RELS 440</td>
<td>Religion and Culture</td>
</tr>
<tr>
<td>PSYC/AAAS/CRJ 322</td>
<td>Psychology of Prejudice</td>
</tr>
<tr>
<td>PSYC/WGST 3955</td>
<td>Diversity and the Workplace</td>
</tr>
<tr>
<td>SOC/AAAS/Ckj 403</td>
<td>Minority Groups</td>
</tr>
<tr>
<td>SOC/AAAS 449</td>
<td>Black Family in Contemp Amer</td>
</tr>
<tr>
<td>SOC/RELS 455</td>
<td>Sociology of Religion</td>
</tr>
<tr>
<td>SOC 4045/AAAS 404/WGST 404</td>
<td>Dissed: Differ, Power, Discrim</td>
</tr>
</tbody>
</table>

**Groups and Interpersonal Relationships (CAGT): Select one course from:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 320/CRJ 382/SOC 382</td>
<td>Social Psychology</td>
</tr>
<tr>
<td>PSYC/AAAS/CRJ 322</td>
<td>Psychology of Prejudice</td>
</tr>
<tr>
<td>PSYC/CRJ 325</td>
<td>Psyc of Interpersonal Relation</td>
</tr>
<tr>
<td>PSYC/CRJ 421</td>
<td>Group Processes</td>
</tr>
<tr>
<td>PSYC/WGST 3955</td>
<td>Diversity and the Workplace</td>
</tr>
<tr>
<td>SOC/CRJ/WGST 446</td>
<td>Marriage and Family Problems</td>
</tr>
<tr>
<td>SOC/CRJ/WGST 447</td>
<td>Family Violence</td>
</tr>
<tr>
<td>SOC/ANTH/WGST 451</td>
<td>Family, Sexuality, Rights</td>
</tr>
<tr>
<td>SOC 4045/AAAS 404/WGST 404</td>
<td>Dissed: Differ, Power, Discrim</td>
</tr>
</tbody>
</table>

**Societal Issues (CASI): Select one course from:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 421</td>
<td>Education and Culture</td>
</tr>
<tr>
<td>PSYC 4305</td>
<td>Psychology in the Workplace</td>
</tr>
<tr>
<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
</tr>
<tr>
<td>SOC 445</td>
<td>The Family</td>
</tr>
<tr>
<td>SOC/CRJ/WGST 446</td>
<td>Marriage and Family Problems</td>
</tr>
<tr>
<td>SOC/CRJ/WGST 447</td>
<td>Family Violence</td>
</tr>
<tr>
<td>SOC/CRJ 466</td>
<td>Drugs, Alcohol, and Society</td>
</tr>
<tr>
<td>SOC/CRJ 469</td>
<td>Juvenile Delinquency</td>
</tr>
</tbody>
</table>

**Social Structure (CASO): Select one course from:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 376</td>
<td>Power &amp; Privilege in SE Mich</td>
</tr>
<tr>
<td>ANTH/WGST 420</td>
<td>Kinship and Marriage</td>
</tr>
<tr>
<td>CRJ 468</td>
<td>Criminology</td>
</tr>
<tr>
<td>SOC/CRJ 423</td>
<td>American Social Classes</td>
</tr>
<tr>
<td>SOC 426</td>
<td>Society and Aging</td>
</tr>
<tr>
<td>SOC 457</td>
<td>Family, Aging and the Law</td>
</tr>
<tr>
<td>SOC 460</td>
<td>America in a Global Society</td>
</tr>
<tr>
<td>SOC/CRJ 467</td>
<td>Drugs, Crime, and Justice</td>
</tr>
<tr>
<td>SOC/AAAS/CRJ 473</td>
<td>Race, Crime and Justice</td>
</tr>
<tr>
<td>SOC 477</td>
<td>Social Welfare</td>
</tr>
<tr>
<td>SOC 483</td>
<td>Images of Organizations</td>
</tr>
</tbody>
</table>

**Internship: Select one from:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 485</td>
<td>Psychology Internship</td>
</tr>
<tr>
<td>or CRJ 478</td>
<td>Criminal Justice Internship</td>
</tr>
</tbody>
</table>

**Electives**

Select 6 credits of additional upper level courses from ANTH, PSYC and SOC:

**Total Credit Hours:**

39-40

**Notes:**
1. PSYC 485 or CRJ 478 must be elected at UM-Dearborn.
2. At least 24 of the 39 upper level hours in ANTH, PSYC, and SOC for the Behavioral Science major must be elected at UM-Dearborn.
3. Many courses are cross listed between the ANTH, PSYC and SOC disciplines. Be sure to consult the Schedule of Classes for cross listed classes.
4. Any one course may be used to satisfy only one requirement within the major.
5. A maximum of 48 credit hours in any one discipline (ANTH, PSYC, SOC) is allowed toward degree.

**Honors Program in Behavioral Sciences**

Behavioral Science students are eligible for the Honors Program which provides special opportunities for outstanding students, including a research training seminar, followed by independent research conducted in collaboration with faculty members. Students are accepted into the Honors Program early in their junior year. Prospective students should plan on completing the statistics and methods requirements by their junior year. Requirements for entrance are 1) GPA of 3.2 or higher in behavioral science courses and overall UM-Dearborn courses, and 2) informal evidence of being a superior student, such as high motivation and ability to work independently. Requirements for graduation with honors in behavioral science are the successful completion of the following:

- Fulfillment of all requirements for Behavioral Sciences major
- PSYC 381 Principles of Statistics and Experimental Design
- PSYC 481 Computers in Psychology, normally taken Fall term, senior year
- PSYC 498 (Honors Seminars) normally taken Winter Term, junior year
- PSYC 499 (Honors Research) normally completed during senior year
- Research Proposal meeting, normally completed early in senior year
- Final Oral Defense, completed at least one month prior to graduation

**Biochemistry**

This degree program is designed to provide the student with an understanding of the structural and functional relationships between the chemical constituents of cells and their roles in life processes. The requirements include courses in biological sciences and chemistry, and appropriate courses in mathematics and physics. The degree in biochemistry prepares a student for careers in industry, medicine, teaching and research.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

- Ancient Greek I and II MCL 105 and MCL 106
- Arabic I and II ARBC 101 and ARBC 102
- Armenian I and II MCL 111 and MCL 112
- Chinese I and II CHIN 101 and CHIN 102
- French I and II FREN 101 and FREN 102
- German I and II GER 101 and GER 102
- Latin I and II LAT 101 and LAT 102
- Spanish I and II SPAN 101 and SPAN 102

**Prerequisites to the Major**

A solid background in mathematics is essential to success in any of the scientific disciplines. Incoming students who intend to choose a major in Biochemistry should have completed at least three years of high school mathematics. First year students should plan to enroll in MATH 105, MATH 115 or MATH 116 based on the results of their math placement tests. The CHEM 134 and CHEM 136 or CHEM 144 and CHEM 146 sequence is a prerequisite to many other courses in the Natural Sciences Department; students should complete this sequence as early as possible.
### Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCHM 210</td>
<td>Biochemistry Laboratory Techniques</td>
<td>2</td>
</tr>
<tr>
<td>BIOL 130 &amp; BIOL 140</td>
<td>Intro Org and Environ Biology and Intro Molec &amp; Cellular Biology</td>
<td>8</td>
</tr>
<tr>
<td>MATH 115 &amp; MATH 116</td>
<td>Calculus I and Calculus II</td>
<td>8</td>
</tr>
<tr>
<td>CHEM 225 &amp; CHEM 226 &amp; CHEM 227</td>
<td>Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory</td>
<td>8</td>
</tr>
<tr>
<td>PHYS 150 &amp; PHYS 151</td>
<td>General Physics I and General Physics II</td>
<td>8</td>
</tr>
<tr>
<td>PHYS 125 &amp; PHYS 126</td>
<td>Introductory Physics I and Introductory Physics II</td>
<td>8</td>
</tr>
</tbody>
</table>

**Total Credit Hours** 42

### Biochemistry Core

<table>
<thead>
<tr>
<th>Code / Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCHM/BIOL/ BIOL/ CHEM 470</td>
<td>15</td>
</tr>
<tr>
<td>BCHM/BIOL/ CHEM 471</td>
<td></td>
</tr>
<tr>
<td>BCHM/BIOL/ CHEM 472</td>
<td></td>
</tr>
<tr>
<td>BCHM/BIOL/ CHEM 473</td>
<td></td>
</tr>
<tr>
<td>BCHM/BIOl/ CHEM 474</td>
<td></td>
</tr>
<tr>
<td>BCHM 496</td>
<td></td>
</tr>
</tbody>
</table>

### Chemistry

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 368</td>
<td>Physical Chemistry I</td>
<td>3</td>
</tr>
</tbody>
</table>

### Biochemistry Electives

- Any BCHM upper level courses (excluding BCHM 495, BCHM 498, and BCHM 499)

### Statistics

- Select one of the following:
  - STAT 301 | Biostatistics I
  - STAT 325 | Applied Statistics I
  - STAT 455 | Environmental Statistics

**Total Credit Hours** 15

1. Elective credits needed may vary depending on biochemistry electives credits and statistics credits completed.

### Notes:

1. A maximum of 65 hrs. in BCHM, BIOL, CHEM may count towards the 120 hours for degree.
2. At least 20 of the 30 upper level hours must be elected at UM-Dearborn.
3. A maximum of 6 hrs. of independent study/research in any Dept. of Natural Sciences discipline may count towards the 120 hours required to graduate.
4. BCHM 370 cannot be used in the major.

### Honors Degree in Biochemistry

The Biochemistry program seeks to recognize exceptional biochemistry majors who are exemplary in coursework and productive in research.

Honors in Biochemistry will be earned by meeting all of the following criteria:

- cumulative GPA of 3.5 or higher in Biochemistry courses
- cumulative GPA of 3.3 or higher in all university courses
- completion of a minimum of 6 six credit hours of Independent/Directed Research (BCHM 495/498/499), spread over 2 or more years, under the supervision of one principal investigator, who will serve as thesis advisor. This research must have a biochemical (broadly defined) focus.
- presentation of the research in a public forum (e.g. scientific meeting, College of Arts, Sciences, and Letters (CASL) Research Day, Department of Natural Sciences Poster Day)
- completion of a thesis-like document that thoroughly describes the background, experimental design, methodology and discussion of data generated in the context of the scientific literature.
- defense of the research thesis before a committee of four faculty: the thesis advisor, two full time Faculty from the Biochemistry program committee and one external member of the student’s choosing.
- In order to be considered for Honors in Biochemistry, a student must complete and submit an honors application to the Biochemistry Program committee Chair via his/her advisor no later than the end of the term prior to graduation.

### Minor or Integrative Studies Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in biochemistry (BCHM) from the following:

#### Required: BCHM 370 or BCHM 470 and BCHM 471

Additional biochemistry (BCHM) courses: 6-9 credits BCHM to equal 12 credits total.

A maximum of 3 credit hours of independent study/research (BCHM 495, BCHM 498, or BCHM 499) can be applied to meet the requirements of the minor or concentration.
If BCHM 370 is completed, BCHM 470 and BCHM 471 cannot be used in the minor/concentration. If BCHM 470 and BCHM 471 is completed, BCHM 370 cannot be used in the minor/concentration.

At least 9 of the 12 credits must be elected at UM-Dearborn.

**BCHM 210 Biochemistry Laboratory Techniques** 2 Credit Hours
Biochemical Laboratory Techniques in an introduction to the equipment, procedures, and concepts used in the biochemistry laboratory. The class will cover topics such as scientific literature, keeping a laboratory notebook, statistical analysis and computer programs, as they relate to biochemistry. (W,Y,R)

**Prerequisite(s):** CHEM 134 or CHEM 144 and CHEM 136 or CHEM 146 and BIOL 140

**Restriction(s):**
Can enroll if Major is Biochemistry

**BCHM 352 Introduction to Toxicology** 3 Credit Hours
An introduction to the principles of toxicology with an emphasis on environmental toxicology. Major topics include toxic agents, toxicological mechanisms, and use of toxicological reference literature. Discussion of chemical carcinogenesis, genetic toxicology, immunotoxicology, teratology, and toxic responses of the skin, eyes, and nervous system. Three hours lecture. (AY).

**Prerequisite(s):** CHEM 225

**BCHM 370 Principles of Biochemistry** 3 Credit Hours
A concise but comprehensive survey of various areas of biochemistry designed for non-biochemistry majors. The course follows the standard approach to the subject including a description of cells, their structure and constituent macromolecules (proteins, nucleic acids, carbohydrates and lipids), enzymology, bioenergetics, intermediary metabolism, and gene regulation. Students cannot take both Biochemistry 370 and 470 or 471 for any combination of concentration, cognate or minor requirement. Three hours lecture. (AY).

**Prerequisite(s):** CHEM 225 and BIOL 140

**BCHM 390 Current Topics in Biochemistry** 1 to 3 Credit Hours
Special topics current to the field of biochemistry. Topics and format for the course may vary. See Schedule of Classes for current topic. Permission of instructor. (OC).

**Prerequisite(s):** (BCHM 370* or BIOL 370* or CHEM 370*) or (BCHM 470* or CHEM 470*) and CHEM 227

**BCHM 404 Mech. Chronic Human Disease** 3 Credit Hours
This course focuses on the biochemical, molecular and cellular mechanisms underlying the progression of chronic diseases, such as diabetes mellitus and atherosclerosis. Techniques in epidemiology, pathology, genetics, molecular biology, and biochemistry are used to understand how relevant physiological processes become pathological. The examination of chronic diseases provides an opportunity to understand biological processes across many scales of life, from extracellular matrix proteins to cells in blood vessel walls to risk factors in patient populations to the pharmacology of treatments. Use of primary literature is emphasized. Three hour lecture.

**Prerequisite(s):** BIOL 301 or BIOL 306 or BIOL 357 or BCHM 370 or CHEM 370 or BCHM 471 or CHEM 471

**Restriction(s):**
Can enroll if Class is Junior or Senior

**BCHM 430 Bioinorganic Chemistry** 3 Credit Hours
This course examines the roles that metals play in biological systems, including the chemical principles that make metal ions well-suited for roles in protein structure, in redox catalysis and in acid base chemistry. The physical and experimental techniques that are applied to explore the structure and function of metals systems will be introduced using case studies from the primary scientific literature in the field. BCHM 370 or its equivalent are strongly recommended but not required.

**Prerequisite(s):** CHEM 136 and BIOL 140

**BCHM 470 Biochemistry I** 3 Credit Hours
Life processes from a chemical viewpoint: structure/function relationships of biomolecules with emphasis on proteins, enzyme kinetics, and mechanisms of action. Three hours lecture. (W).

**Prerequisite(s):** (BIOL 130 and BIOL 140 and CHEM 134) or (CHEM 144 and CHEM 136) or (CHEM 146 and CHEM 225)

**BCHM 471 Biochemistry II** 3 Credit Hours
Intermediary metabolism, bioenergetics, energy transformation, metabolic interrelationships, biochemical regulation, highly structured subcellular biochemical systems. Three hours lecture. (W).

**Prerequisite(s):** BCHM 470 or CHEM 470 or BIOL 470

**BCHM 472 Biochemistry Laboratory I** 1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of proteins and nucleic acids. Physical and chemical properties of proteins and nucleic acids. Four hours laboratory. CHEM 344 Recommended. (F).

**Prerequisite(s):** (BCHM 470* or BCHM 470* or CHEM 470*) and CHEM 227

**BCHM 473 Biochemistry Laboratory II** 1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of lipids and carbohydrates. Methods in metabolism. Four hours laboratory. (W).

**Prerequisite(s):** (BCHM 471* or BIOL 471* or CHEM 471*) and (BCHM 472* or BIOL 472* or CHEM 472*)

**BCHM 474 Molecular Biology** 4 Credit Hours
This course will emphasize the molecular biology of eukaryotes, and topics will include genome organization and complexity, chromatin structure and function, gene expression, DNA replication and repair, genetic rearrangements, and the molecular biology of development. The laboratory will emphasize the application of recombinant DNA technology to the study of biological problems. Three hours lecture, four hours laboratory. (W).

**Prerequisite(s):** (BCHM 470 or CHEM 470 or BIOL 470) or (BCHM 370 or CHEM 370 and CHEM 227)

**Corequisite(s):** BCHM 474L

**BCHM 480 Biochemical Pharmacology** 3 Credit Hours
Pharmacology is a study of drugs. In this course, the biochemical and molecular basis of drug action will be emphasized. Different categories of drugs, their use, abuse, and side effects will be presented. Three hours lecture. Permission of instructor. (OC).

**Prerequisite(s):** CHEM 370 or BCHM 370 or BIOL 370 or CHEM 470 or CHEM 470 or BIOL 470

**BCHM 485 Nutrition and Metabolism** 3 Credit Hours
Full Course Title: The Biochemistry of Human Nutrition and Metabolism Human Nutrition and Metabolism is an introduction to the relationship between food and nutrients, and their integration in the metabolic pathways. An understanding of the molecular basis of nutrition, related diseases, and overall health will be built on previous knowledge of cell biology and biochemistry. (AY)

**Prerequisite(s):** (BCHM 471 or BIOL 471 or CHEM 471) or (BCHM 370 or BIOL 370 or CHEM 370)
BCHM 490  Topics in Biochemistry  1 to 3 Credit Hours
A course in special topics that examines research problems of current interest in biochemistry. Topics and format may vary. See current Schedule of Classes. One to three hours seminar. (W).

BCHM 495  Off-Campus Research in Biochem  1 to 3 Credit Hours
Participation in ongoing research at an off-campus laboratory. No more than 5 hours combined from any Natural Science courses numbered 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F,W,S).

BCHM 496  Complex Systems  3 Credit Hours
Full Title: Biochemistry Capstone: Complex systems in Biochemistry
A complex system is defined as a system featuring a large number of interacting variables whose combined activity is non-linear and whose seemingly random behavior leads to self-organization. Current topics ** are used to explore how complex systems function in biology. All reading material in the class are taken from the scientific literature giving students a chance to become familiar with how biochemists convey ideas and report their findings. Each student will present a paper to the class to demonstrate the ability to communicate concepts of Biochemistry effectively. Students will also learn the process of proposal writing and will have the opportunity to research and write their own proposal and have it peer-reviewed by their classmates. **The topics for this course will change each year, depending on the instructor, and the focus of current advances in Biochemistry/Complex systems. (W,YR)
Prerequisite(s): BCHM 470 and BCHM 472 and BCHM 474
Restriction(s):
Can enroll if Class is Senior

BCHM 497  Seminar in Biochemistry  1 Credit Hour
A seminar course that examines research problems of current interest in biochemistry. The course format may include training students to read and present scientific papers, guest lecturers, and lectures by the instructor on a selected topic. One hour seminar. Permission of instructor. (W).
Prerequisite(s): (BCHM 470 or BIOL 470 or CHEM 470) and (BCHM 474 or BIOL 474)

BCHM 498  Directed Reading in Biochem  1 to 3 Credit Hours
Library research in a specific area of biochemistry performed under the direction of a faculty member. No more than six hours combined from departmental courses numbered 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours readings. Permission of instructor. (F,W,S).

BCHM 499  Laboratory Research in Biochem  1 to 3 Credit Hours
Directed laboratory research performed under the supervision of a faculty member. Research training is encouraged. No more than six hours combined from departmental courses numbered 495, 498, and 499 may be credited toward the 120 hours required for graduation. Four to twelve hours laboratory. Permission of instructor. (F,W,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

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**Biological Sciences**

Biology is an extensive field that covers biochemistry, molecular biology, cell biology, microbiology, genetics, anatomy, physiology, embryology, ecology, evolution, field biology, and animal behavior. The Bachelor of Science in Biological Sciences is recommended for students who wish to study biology as part of an undergraduate liberal arts degree, to prepare for graduate study in biology or any of the health professions, or to study for a secondary teaching certificate in biology.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESC) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesc)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)
Foreign Language Requirement
Complete a two-semester beginning language sequence.

Ancient Greek I and II  MCL 105 and MCL 106
Arabic I and II  ARBC 101 and ARBC 102
Armenian I and II  MCL 111 and MCL 112
Chinese I and II  CHIN 101 and CHIN 102
French I and II  FREN 101 and FREN 102
German I and II  GER 101 and GER 102
Latin I and II  LAT 101 and LAT 102
Spanish I and II  SPAN 101 and SPAN 102

Pre-Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 144</td>
<td>Gen Chemistry IB</td>
<td></td>
</tr>
<tr>
<td>CHEM 136</td>
<td>General Chemistry IIA</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 146</td>
<td>General Chemistry IIB</td>
<td></td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CHEM 226</td>
<td>and Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM 227</td>
<td>and Organic Chemistry Laboratory</td>
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Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>8</td>
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<tr>
<td>&amp; PHYS 126</td>
<td>and Introductory Physics II</td>
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</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td></td>
</tr>
<tr>
<td>&amp; PHYS 151</td>
<td>and General Physics II</td>
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</tr>
<tr>
<td>MATH 113</td>
<td>Calc I for Biology &amp; Life Sci</td>
<td>4</td>
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<tr>
<td>or MATH 115</td>
<td>Calculus I</td>
<td></td>
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Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>MATH 114</td>
<td>Calc II for Biology &amp; Life Sci</td>
<td>3-4</td>
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<tr>
<td>MATH 116</td>
<td>Calculus II</td>
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</tr>
<tr>
<td>STAT 301</td>
<td>Biostatistics I</td>
<td></td>
</tr>
<tr>
<td>STAT 455</td>
<td>Environmental Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 39-40

Mathematics and chemistry are essential to success in biology and should be taken as early as possible. Chemistry and mathematics course serve as prerequisites for many biology courses.

Major Requirements

30 credit hours of 300/400; 3000/4000 level biological sciences (BIOL) courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 306</td>
<td>General Genetics</td>
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</table>

Genetics:

Ecology:

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOL/ESCI 304</td>
<td>Ecology</td>
<td>4</td>
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<tr>
<td>BIOL/ESCI 337</td>
<td>Plant Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 456</td>
<td>Behavioral Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 360</td>
<td>Population Genetics &amp; Evolutn</td>
<td>3</td>
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</tbody>
</table>

Evolution:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOL 303</td>
<td>Comparative Animal Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 305</td>
<td>Anatomy and Physiology II 3</td>
<td></td>
</tr>
<tr>
<td>BIOL 335</td>
<td>Plant Physiology</td>
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</tbody>
</table>

Physiology:

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOL 301</td>
<td>Cell Biology</td>
<td>3-4</td>
</tr>
<tr>
<td>BIOL/BCHM/ CHEM 370</td>
<td>Principles of Biochemistry</td>
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</tr>
<tr>
<td>BIOL 385/ MICR 405</td>
<td>Microbiology</td>
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</tbody>
</table>

Capstone Experience (CACY)

Select one from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOL 402</td>
<td>Physiology of Excitable Cells</td>
<td></td>
</tr>
<tr>
<td>BIOL 404</td>
<td>Mech. Chronic Human Disease</td>
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</tr>
<tr>
<td>BIOL/MICR 405</td>
<td>Applied &amp; Environ Microbiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 412</td>
<td>Vertebrates 1</td>
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<tr>
<td>BIOL 419</td>
<td>Behavior and Evolution</td>
<td></td>
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<tr>
<td>BIOL/ESCI 420</td>
<td>Advanced Field Ecology</td>
<td></td>
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<tr>
<td>BIOL/ESCI 422</td>
<td>Conservation Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 452</td>
<td>Med &amp; Env Toxicology</td>
<td></td>
</tr>
<tr>
<td>BIOL 476</td>
<td>Cancer Cell Biology</td>
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<tr>
<td>BIOL 491</td>
<td>Capstone Course in Biology</td>
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<tr>
<td>BIOL 492</td>
<td>Capstone Research Experience</td>
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<tr>
<td>BIOL 493</td>
<td>Capstone Teaching Experience</td>
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<tr>
<td>BIOL 491</td>
<td>Capstone Course in Biology</td>
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</tr>
<tr>
<td>BIOL 492</td>
<td>Capstone Research Experience</td>
<td></td>
</tr>
<tr>
<td>BIOL 493</td>
<td>Capstone Teaching Experience</td>
<td></td>
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</tbody>
</table>

Additional Upper Level (300+) Biology Courses (BIOL) 2  8-11

1. BIOL 312 prior to Fall ‘15
2. To total a minimum of 30 credit hours.
3. Credit cannot be earned for both BIOL 105 and BIOL 305. BIOL 105 cannot be used in the biology major.

Notes:

1. A maximum of 6 credit hours in BIOL 492, BIOL 493, BIOL 495, BIOL 497, BIOL 498 and BIOL 499 can be applied toward the 30 credit major requirement.
2. A maximum of 50 hours in biological sciences courses may be applied toward the 120-credit-hour total required for graduation.
3. In the 30 credit hours required for the major, students may use either BIOL 370/BCHM 370/CHEM 370 or BIOL 470/BCHM 470/CHEM 470 and/or BIOL 471 / BCHM 471 / CHEM 471.
4. At least 15 of the 30 upper level hours required in the BIOL major must be elected at UM-Dearborn.
5. A maximum of 6 credit hours combined of independent study/ research in any natural science discipline may be applied toward the 120 credit hours required for degree.
Minor or Integrative Studies
Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in biological sciences (BIOL). Note that all BIOL courses include prerequisites in biology and some include prerequisites in chemistry or mathematics.

BIOL 100  Principles of Biology  3 Credit Hours
A lecture course introducing non-science concentrators to major areas of biology, including cell biology, genetics, human physiology, plant biology, ecology, and evolution. Topics of current interest are discussed. Students cannot use both BIOL 100 and NSCI 120 to satisfy the Natural Sciences distribution requirements. Three hours lecture. (F,W).

BIOL 103  Anatomy and Physiology I  4 Credit Hours
The structural and functional relationships of the human body at the cellular, tissue, organ, and system levels are analyzed. Students identify the major anatomical parts and relate these to the physiological activities of the circulatory, skeletal, nervous, muscular, and digestive systems. The homeostatic effects of fluids, electrolytes, and acids and bases throughout the integrated human body are analyzed. Four hours lecture, three hours laboratory. (F).

Corequisite(s): BIOL 103L

BIOL 105  Anatomy and Physiology IIA  4 Credit Hours
The major anatomical parts of the cardiovascular, respiratory, reproductive, endocrine, nervous, and urinary systems of the human body are identified and related to the physiological activities of these systems. Emphasis is placed on the homeostatic effects of fluids, electrolytes, acids, and bases throughout the integrated human body. Four hours lecture, three hours laboratory. (W)

Prerequisite(s): BIOL 103
Corequisite(s): BIOL 105L

BIOL 130  Intro Org and Environ Biology  4 Credit Hours
An introduction to organismal and environmental biology, with emphasis on plant and animal diversity, structure, physiology, and development; ecology; and evolution. This course complements BIOL 140, which need not be taken as a prerequisite; together they constitute an introduction to biology. This course is intended for science concentrators. Three hours lecture, four hours laboratory/recitation. (F,W,S).

Corequisite(s): BIOL 130L

BIOL 140  Intro Molec & Cellular Biology  4 Credit Hours
An introduction to molecular and cellular aspects of biology with emphasis on cell structure and function, biochemistry, genetics, cell growth, and the origin of life. This course complements BIOL 130; together they constitute an introduction to biology. This course is intended for science concentrators. Three hours lecture, four hours laboratory/recitation.

Prerequisite(s): CHEM 134* or CHEM 144*
Corequisite(s): BIOL 140L

BIOL 240  Great Experiments in Biology  3 Credit Hours
An individualized-learning course that portrays the development of modern biological science. The course does not require attendance in classes since it can be completed at home and in the library by means of study guides, audio cassettes, slide/tape presentations, and computer-assisted instruction. (F,W,S).

BIOL 242  Great Experiments Laboratory  1 Credit Hour
An individualized-learning laboratory science course that can be completed at home. Historically important and model experiments are performed in order to demonstrate how hypotheses are drawn and tested. Data are analyzed at a computer terminal. (F,W,S).

Prerequisite(s): BIOL 240*

BIOL 290  Topics in Biology and Society  3 Credit Hours
An introduction to themes of biology reflecting the interaction between biology and society. Topics vary and are announced in the current Schedule of Classes. The course may be repeated no more than once under a different topic. Three hours lecture. (OC).

BIOL 291  Biology and Society Laboratory  1 Credit Hour
A laboratory course to accompany BIOL 290. Three hours laboratory. (OC).

Prerequisite(s): BIOL 290

Corequisite(s): BIOL 291

BIOL 293  Principles of Biology Laboratory  1 Credit Hour
BIOL 294  Principles of Biology Laboratory for NSCI 120  1 Credit Hour

BIOL 303  Comparative Animal Physiology  4 Credit Hours
Physiological processes and their control in higher animals. Emphasis ranges from the cellular mechanisms and systemic patterns of regulation of body functions to the evolutionary and environmental adaptations determining body form and function in diverse animal types. Three hours lecture, four hours laboratory. MATH 114 is recommended. (F).

Prerequisite(s): BIOL 130 and BIOL 140 and (CHEM 124 or CHEM 134 or CHEM 144)

Corequisite(s): BIOL 303L

BIOL 304  Ecology  4 Credit Hours
Relationships between organisms and their environments. Patterns in the physical environment, physiological and behavioral adaptations, population dynamics, energy flow, nutrient cycling; succession. Three hours lecture, four hours laboratory (with field trips). (F, S).

Prerequisite(s): BIOL 130 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 116)

Corequisite(s): BIOL 304L

BIOL 305  Anatomy and Physiology IIB  4 Credit Hours
The major anatomical parts of the cardiovascular, respiratory, reproductive, endocrine, nervous, and urinary systems of the human body are identified and related to the physiological activities of these systems. Emphasis is placed on the homeostatic effects of fluids, electrolytes, acids, and bases throughout the integrated human body. Students complete additional work beyond what is required in BIOL 105. Four hours lecture, three hours laboratory.

Prerequisite(s): BIOL 103
Corequisite(s): BIOL 305L

BIOL 306  General Genetics  3 Credit Hours
An intermediate course in classical, molecular and evolutionary genetics. The structure, function, and inheritance of genetic material in prokaryotes, eukaryotes and viruses are discussed. Topics include DNA and chromosome structure, genetic linkage and mapping, gene expression and its regulation, human genetic disease, and population genetics. Three hours lecture, one hour recitation. (F).

Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 306R

BIOL 306*  Topics in Genetics  3 Credit Hours
An introduction to advanced topics in molecular biology and genetics. Topics include gene expression, molecular biology techniques, and advanced concepts in genetics. Three hours lecture. (F,W,S).
BIOL 306R  General Genetics Recitation  0 Credit Hours
Recitation component of BIOL 306. Must be taken concurrently with BIOL 306.
Corequisite(s): BIOL 306

BIOL 307  General Genetics Laboratory  1 Credit Hour
A semester-long laboratory course dealing with investigation and analysis in genetics. Laboratory sessions will include genetic crosses of plants and animals and the subsequent analysis to determine linkage and gene mapping location. Computer exercises will also be used to establish genetic tools for modern molecular analysis. Four hours laboratory. (W).
Prerequisite(s): BIOL 306*

BIOL 309  Introduction to Mycology  4 Credit Hours
An introduction to the biology of the fungi. Classification, structure, industrial use, gastronomic qualities, and disease-producing ability of macroscopic and microscopic forms are studied. Laboratories include microscopic and macroscopic examinations of fungi and their growth and field studies on the occurrence and classification of edible and poisonous varieties. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 130 and BIOL 140

BIOL 310  Histology  4 Credit Hours
Descriptive approaches to the study of the microscopic anatomy of animal tissue. The course emphasizes the study of cell and tissue types, selected organs and the interpretation of electron micrographs. Three hours lecture, four hours laboratory. (AY, F).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 310L

BIOL 311  Embryology  4 Credit Hours
Descriptive and experimental approaches to a comparative study of reproduction, morphogenesis, and growth. Emphasis is placed on the vertebrates, but some attention is focused on the development of invertebrates and plants. Three hours lecture, four hours laboratory. (AY, W).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 311L

BIOL 313  Plant Taxonomy and Systematics  4 Credit Hours
Characteristics, distribution, and relationships of plants with special reference to the local Michigan flora. Three hours lecture, four hours laboratory (including field work) per week. (OC).
Prerequisite(s): BIOL 130

BIOL 315  Aquatic Ecosystems  4 Credit Hours
An introduction to the physical, chemical, and biological characteristics of lakes, rivers, and wetlands emphasizing a comparison of ecosystem structure and function. Laboratory emphasizes data collection and analysis to characterize a representative lake, river, and wetland. Lecture and laboratory. (AY, F).
Prerequisite(s): BIOL 130 and (CHEM 124 or GEOL 118)

BIOL 320  Field Biology  4 Credit Hours
Adaptations, taxonomy, systematics, ecology, and behavior of southeastern Michigan flora and fauna. Techniques of field observation and recording are emphasized. Skills in the use of identification keys and guides are developed. The campus Environmental Study Area is used intensively. Three hours lecture, four hours laboratory (with field trips). (S).
Prerequisite(s): BIOL 101 or BIOL 130 or NSCI 120 or NSCI 233

BIOL 324  Invertebrate Zoology  4 Credit Hours
This course introduces students to the diversity of invertebrate animals from a functional evolutionary perspective. The lecture will focus on the unique aspects of the morphology, physiology, and ecology of major phyla in light of the selective forces that have favored their evolution, as well as consider the intersection of invertebrates and humans. Through dissection, prepared slides and field observations, the laboratory will introduce the diversity of invertebrate phyla and subgroups, with emphasis on form and function.
Prerequisite(s): BIOL 130

BIOL 333  Plant Biology  4 Credit Hours
A thorough survey of the evolutionary trends in plant reproduction and morphology will be considered. This survey will extend into the field of plant anatomy, but not plant physiology, which is covered in a separate course. Major groups to be studied include: bacteria, algae, fungi, liverworts, lichens, mosses, ferns, and seed plants. Certain less familiar groups will also be emphasized. Plant diversity will be examined from the perspective of its import to civilizations of the past and future. Three hours lecture, four hours laboratory. (F, S).
Prerequisite(s): BIOL 130
Corequisite(s): BIOL 333L

BIOL 335  Plant Physiology  4 Credit Hours
Physiological principles as they apply to the major plant groups. Topics include cellular metabolism, water balance, translocation, photosynthesis, mineral nutrition, growth and development and production of secondary substances. Three hours lecture, four hours laboratory. (W).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 335L

BIOL 337  Plant Ecology  3 Credit Hours
This course focuses on different aspects of the relationship between plants and their environment. Topics include: a) interactions of plants with the physical environment; b) ways in which the environment acts to shape plant populations through evolution; c) intra- and interspecific interactions among individuals; and d) large-scale patterns and processes at the landscape-level. Three hours lecture.
Prerequisite(s): BIOL 130

BIOL 350  Introduction to Neurobiology  4 Credit Hours
An introduction to nervous systems and how they function. This course includes the cellular physiology and anatomy of nervous systems in vertebrates and invertebrates, and how these cellular activities are integrated into systems to produce complex, coordinated behavior. Three hours lecture. (W).
Prerequisite(s): BIOL 130 and BIOL 140
Corequisite(s): BIOL 350L

BIOL 352  Endocrinology  3 Credit Hours
This class will provide intermediate and advanced undergraduates with a basic understanding of the function of the endocrine system. The course will progress from a consideration of basic concepts and mechanisms to the physiology (function) of specific endocrine systems. Interactions between organ systems will also be emphasized. Specific sections of the course will focus on function of the endocrine system during stress, fluid balance, metabolism (including calcium, glucose, lipid, and proteins), reproductive growth, development, and aging.
Prerequisite(s): BIOL 140 and BIOL 130 and CHEM 134
BIOL 353 Ornithology  3 Credit Hours
A study of the unique features of birds as representatives of vertebrates, including their morphology, anatomy, physiology, physics of flight, mating systems, social structure, vocalizations, orientation and migration, origin and evolution, growth and development, and issues in avian conservation. Students learn about the current research on bird migration at the Rouge River Bird Observatory on campus. Students develop individual species analysis of life and natural histories. Three hours lecture.
Prerequisite(s): BIOL 130

BIOL 357 Human Physiology  3 Credit Hours
Systems of the human body and their function are investigated individually and as part of an integrated natural living system. Topics include cell structure and function of nerves, muscles, the lungs, heart, blood vessels, kidneys, digestive tract, endocrine glands, brain, and reproductive organs.
Prerequisite(s): (BIOL 130 and BIOL 140) or (BIOL 103 and BIOL 105)

BIOL 360 Population Genetics & Evolution  3 Credit Hours
Processes which change the genetic composition of populations: mutation, gene flow, genetic drift, and natural selection. The origin of subspecies, species, and higher taxa. Evidence of evolution from the geological record, comparative anatomy, comparative biochemistry and other sources. Three hours lecture. (F,W)
Prerequisite(s): BIOL 130 and BIOL 140 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 116)

BIOL 361 Population Genetics & Evol Lab  1 Credit Hour
A laboratory course to accompany BIOL 360. Four hours laboratory. (OC).
Prerequisite(s): BIOL 360*

BIOL 370 Principles of Biochemistry  3 Credit Hours
A concise but comprehensive survey of various areas of biochemistry designed for non-biochemistry majors. The course follows the standard approach to the subject including a description of cells, their structure and constituent macromolecules (proteins, nucleic acids, carbohydrates and lipids), enzymology, bioenergetics, intermediary metabolism and gene regulation. Students cannot take both BCHM 370 and 470 or 471 for any combination of concentration, cognate or minor requirement. Three hours lecture. (F).
Prerequisite(s): BIOL 140 and CHEM 226

BIOL 380 Epidemiology  3 Credit Hours
Introduces the methods for infectious disease epidemiology (occurrence and spread in population) and case studies of important disease syndromes and entities. Methods include definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness. Case-studies focus on acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria, and other vector-borne diseases. This course emphasizes methods of study that would contribute to understanding diseases etiology.
Prerequisite(s): BIOL 140

BIOL 381 Biotechnology & Bioprocessing  4 Credit Hours
Biotechnology and Bioprocessing class is centered on the study of bioengineering applications found today in the medical and agricultural industries. Students use microorganisms, plant and animal tissue culture, and enzymes during the laboratory period, practicing the fundamentals of “hands-on” genetic engineering and material processing. Students establish and purify proteins from recombinant organisms. Besides technology, ethical and environmental concerns are discussed in the lecture. Three hours lecture, four hours laboratory.
Prerequisite(s): BIOL 140

BIOL 385 Microbiology  4 Credit Hours
The biology of microorganisms is considered through study of the properties of bacteria, fungi, algae, protozoa, and viruses. Microbial structures are discussed and correlated with their function. Aspects of cellular metabolism pertinent to microorganisms are emphasized. The interaction of microorganisms and their environment, animate and inanimate, is discussed with respect to the beneficial or harmful effects of the different microbial groups. Laboratory exercises introduce the student to basic, practical microbiological techniques and illustrate various principles of microbial life. Three hours lecture, four hours laboratory. (F,S).
Prerequisite(s): BIOL 140 and (CHEM 134* or CHEM 144*)
Corequisite(s): BIOL 385L

BIOL 390 Topics in Biology  1 to 4 Credit Hours
Examination of problems and issues in selected areas of biology. Title in Schedule of Classes changes according to content. This course may be repeated for credit when specific topics differ. Permission of Instructor. (OC).

BIOL 402 Physiology of Excitable Cells  3 Credit Hours
An in-depth analysis of the mechanisms underlying electrical communication within and between mammalian cells. The major emphasis is on excitable cells in the brain, heart, and skeletal muscle and their functional integration. Fulfills the Biology major capstone requirement.
Prerequisite(s): BIOL 130 and BIOL 140 and (BIOL 303 or BIOL 305 or BIOL 350)
Restriction(s):
Can enroll if Class is Senior

BIOL 404 Mech. Chronic Human Disease  3 Credit Hours
This course focuses on the biochemical, molecular and cellular mechanisms underlying the progression of chronic diseases, such as diabetes mellitus and atherosclerosis. Techniques in epidemiology, pathology, genetics, molecular biology, and biochemistry are used to understand how relevant physiological processes become pathological. The examination of chronic diseases provides an opportunity to understand biological processes across many scales of life, from extracellular matrix proteins to cells in blood vessel walls to risk factors in patient populations to the pharmacology of treatments. Use of primary literature is emphasized. Three hour lecture.
Prerequisite(s): BIOL 301 or BIOL 306 or BIOL 357 or BCHM 370 or BIOL 370 or CHEM 370 or BCHM 471 or BIOL 471 or CHEM 471
Restriction(s):
Can enroll if Class is Senior

BIOL 405 Applied & Environ Microbiology  4 Credit Hours
The study of the diversity, structure and function of microorganisms as they interact with their environment. Emphasis will be placed on soil microbiology (fungi, bacteria, microalgae) and plant-microbe interactions (pathogens, symbioses). Ecological topics include decomposition, nutrient cycling, bioremediation and agroecosystems. Three hours lecture, four hours laboratory. (W).
Prerequisite(s): BIOL 385 or MICR 385
Restriction(s):
Can enroll if Class is Senior

BIOL 406 Microbial Genetics  3 Credit Hours
This molecular genetics course emphasizes bacteria and viruses. Topics include chromosome structure and replication, recombination, DNA repair, genetic mapping, mechanisms of gene transfer, regulation of gene expression, and mutagenesis. Three hours lecture. (W, YR)
Prerequisite(s): MICR 385 or BIOL 385
BIOL 410  Diversity Issues Health Care  3 Credit Hours
This course will address the effect of race, age, gender, religion, and economic status on medical research and health care. Through an examination of clinical trials and case studies, students will learn how medical research is performed in the United States, and what health care treatments and options for patients are available. Medical treatment and disease topics will be selected and will be evaluated as to how they are influenced by the criteria listed. The examples will focus on both cultural differences and inequity, in national and global settings. (AY).
Prerequisite(s): BIOL 130 and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior

BIOL 412  Vertebrates  5 Credit Hours
A comparative study of the morphology of living animals, including an analysis of structural and functional features, diversity, and macroevolution. The major emphasis is on the comparative functional anatomy of living vertebrates. Three hours lecture, eight hours laboratory. Fulfills the biology major capstone requirement. This course was formerly offered as 312; students cannot receive credit for both BIO 312 and 412. (W, AY)
Prerequisite(s): (BIOL 303 or BIOL 305 or BIOL 335) or BIOL 360
Restriction(s):
Can enroll if Class is Senior

BIOL 414  Limnology  4 Credit Hours
The study of the structural and functional relationships and productivity of organisms in lakes and streams as they are regulated by their physical, chemical and biotic environments. Laboratories will emphasize field study of area lakes and streams. Three hours lecture, four hours laboratory. BIOL/ESCI 304 or ESCI 275 recommended.
Prerequisite(s): BIOL 130 and (CHEM 136 or CHEM 146)
Corequisite(s): BIOL 414L

BIOL 416  Stream Ecology  4 Credit Hours
A study of the physical, chemical and biological characteristics of streams and rivers. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304

BIOL 419  Behavior and Evolution  3 Credit Hours
An in depth examination of how evolutionary processes shape behavior, focusing on the influence of natural, sexual, and kin selection. Topics include behavioral genetics, natural selection, sexual selection, kin selection, optimality, game theory, evolutionary stable strategies, phylogenetics, and the comparative method.
Prerequisite(s): BIOL 140 and BIOL 130
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

BIOL 420  Advanced Field Ecology  4 Credit Hours
An intense study of behavioral ecology and field-oriented research at an advanced level, utilizing ecological habitats on campus and in surrounding urban areas. Focus will be on plant/animal interactions and will include pollination ecology, reproduction and distribution ecology, optimal foraging theory, as well as hypothesis testing of animal migration and distribution of species in extreme urban environments. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304 or BIOL 320
Restriction(s):
Can enroll if Class is Senior

BIOL 421  Diversity & Conservation Biology  3 Credit Hours
This course is a study of the historical and current preservation of global biodiversity. The value of biodiversity, extinction, threats to biodiversity, and both ex situ and in situ conservation strategies are considered. (W, AY)
Prerequisite(s): BIOL 304 or ESCI 304
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

BIOL 422  Conservation Biology  3 Credit Hours
This course is a study of the historical and current preservation of global biodiversity. The value of biodiversity, extinction, threats to biodiversity, and both ex situ and in situ conservation strategies are considered. (W, AY)
Prerequisite(s): BIOL 304 or ESCI 304
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

BIOL 424  Biology of Spiders  4 Credit Hours
An introduction to the biology of spiders and related arachnids. Lectures include spider anatomy, natural history, ecology, and evolution. Laboratory work includes specimen preparation, use of dichotomous keys, spider behavior, field methods, rearing and collecting techniques, and identification of spiders and their webs. Three hours lecture, four hours laboratory. Students cannot receive credit for both Biology 424 and Biology 524.
Prerequisite(s): BIOL 130
Restriction(s):
Cannot enroll if Class is Graduate

BIOL 430  Medical Virology  3 Credit Hours
A general description of the history and nature of animal virus disease. Emphasis is placed on the pathogenesis and clinical description of specific diseases.
Prerequisite(s): BIOL 385 or MICR 385

BIOL 440  Micro Genetics & Physi Lab  1 Credit Hour
This course emphasizes the use of advanced microbiological techniques for understanding the genetics and physiology of microorganisms. Experiments focus on the understanding of general microbial phenomena, such as nutrition, metabolism and biochemistry; protein and nucleic acid synthesis; energy generation, enzyme regulation, membrane transport, motility, differentiation, cellular communication and the behavior of populations.
Prerequisite(s): BIOL 385* or MICR 385* or BIOL 301* or BIOL 406* or MICR 406* or MICR 485* or MICR 485*
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

BIOL 450  Virology  4 Credit Hours
The first half of this course deals with bacterial viruses, with emphasis on classical events in this field. The second half surveys the field of animal viruses, with emphasis on recent discoveries, including replication, pathogenesis, and viral association with cancers. Three hours lecture, four hours laboratory. (AYW).
Prerequisite(s): CHEM 226 and (MICR 385 or BIOL 385)

BIOL 452  Med & Env Toxicology  3 Credit Hours
Mechanistic concepts of toxicology at the cellular and molecular levels. The course is taught from a human health perspective focusing on contemporary problems and environmental associations. Three hours lecture. (W, AY)
Prerequisite(s): BIOL 140 and CHEM 225 and (Biol 370 or Biol 470 or Biol 301)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
BIOL 455  Immunology  4 Credit Hours
A detailed study of the field of immunology. Among the topics covered are various aspects of the immunological response, such as humoral or cell-mediated immunity, cell-cell interactions, and immunology as related to the cause and prevention of disease. Three hours lecture, four hours laboratory. (AYF).
Prerequisite(s): BIOL 385 or BIOL 301 or MICR 385

BIOL 456  Behavioral Biology  4 Credit Hours
This course uses evolutionary and ecological theory to evaluate behavioral adaptations of organisms to their environment. Topics discussed include game theory, kin selection, sexual selection, eusociality, orientation and navigation, and signal evolution. Laboratory sessions include: observations of animal behavior, required manipulations of live animals, and field trips. Three hours of lecture, one four-hour laboratory. Students cannot receive credit for both BIOL 456 and BIOL 556. Student seeking graduate credit should elect BIOL 556.  
Prerequisite(s): BIOL 130  
Restriction(s):  
Cannot enroll if Class is Specialist or Graduate or Doctorate

BIOL 459  Pathogenic Microbiology  4 Credit Hours
An introduction to pathogenic microorganisms and mechanisms of microbial pathogenicity. Disease-causing bacteria, fungi, viruses, and protzoa are studied. Laboratories emphasize clinical approaches to isolation, identification, and treatment. Three hours lecture, four hours laboratory. (AYF).
Prerequisite(s): BIOL 385 or MICR 385

BIOL 470  Biochemistry I  3 Credit Hours
Life processes from a chemical viewpoint: structure/function relationships of biomolecules with emphasis on proteins, enzyme kinetics, and mechanisms of action. Three hours lecture. (W)
Prerequisite(s): (BIOL 130 and BIOL 140 and CHEM 134) or (CHEM 144 and CHEM 136) or (CHEM 146 and CHEM 225)

BIOL 471  Biochemistry II  3 Credit Hours
Intermediary metabolism, bioenergetics, energy transformation, metabolic interrelationships, biochemical regulation, highly structured subcellular biochemical systems. Three hours lecture. (F).
Prerequisite(s): BCHM 470 or BIOL 470 or CHEM 470

BIOL 472  Biochemistry Lab I  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of proteins and nucleic acids. Physical and chemical properties of proteins and nucleic acids. Four hours laboratory. CHEM 344 Recommended. (F).
Prerequisite(s): (BIOL 470 or BCHM 470 or CHEM 470) and CHEM 227

BIOL 473  Biochemistry Laboratory II  1 Credit Hour
The techniques of preparative and analytical biochemistry. Preparation and characterization of lipids and carbohydrates. Methods in metabolism. Four hours laboratory. (W).
Prerequisite(s): (BCHM 471 or BIOL 471 or CHEM 471) and (BCHM 472 or BIOL 472 or CHEM 472)

BIOL 474  Molecular Biology  4 Credit Hours
This course will emphasize the molecular biology of eukaryotes, and topics will include genome organization and complexity, chromatin structure and function, gene expression, DNA replication and repair, genetic rearrangements, and the molecular biology of development. The laboratory will emphasize the application of recombinant DNA technology to the study of biological problems. Three hours lecture, four hours laboratory. (W).
Prerequisite(s): (BCHM 470 or BIOL 470 or CHEM 470) or (BCHM 370 or BIOL 370 or CHEM 370) and CHEM 227
Corequisite(s): BIOL 474L

BIOL 476  Cancer Cell Biology  3 Credit Hours
Cancer is a disease of anti-social cell behavior. This course educates students on the genetics, molecular and cellular changes that normal cells undergo to become cancer cell. Major emphasis is on providing a mechanistic insight into fundamental questions in cancer cell biology. The course also discusses currently available therapeutic treatments and emerging issues in cancer therapy research. Fulfills capstone requirement for biology majors. Three hours lecture.  
Prerequisite(s): BIOL 130 and BIOL 140 and (BIOL 301 or BIOL 306 or BIOL 370 or BCHM 370 or CHEM 370 or BIOL 385 or MICR 385)  
Restriction(s):  
Can enroll if Class is Senior

BIOL 485  Physiology of Micro-organisms  3 Credit Hours
An in-depth examination of the physiology of microorganisms. Areas of emphasis include the growth and nutrition of microorganisms, the development of viruses, the microbial degradation of organic compounds, the regulation of degradation reactions, and the biosynthesis of uniquely microbial compounds and secondary metabolites, such as antibiotics and toxins. Consideration is given to the natural environments of specific microorganisms. Three hours lecture. (W, YR)
Prerequisite(s): (BIOL 385 or MICR 385 or BIOL 370 or BCHM 370 or CHEM 370 or BCHM 370) and CHEM 225*

BIOL 489  Origins of Biological Sciences  3 to 4 Credit Hours
A study of the development of the science of biology as revealed in the writing and experiments of major biologists of the past and present. (OC).

BIOL 490  Sem in Biology/Microbiology  1 to 6 Credit Hours
Directed research on a problem culminating in the preparation of a paper and presentation of a public seminar. Tutorials, lectures and student seminars are given on selection and formulation of research problems, experimental design, and statistical treatment of data. May be repeated for credit with permission of advisor. (OC).

BIOL 491  Capstone Course in Biology  3 Credit Hours
A culminating course for biology majors which focuses on an area of current biological research and integrates material from different subdisciplines of biology. Topic varies and is announced in the Schedule of Classes. Three hours lecture.  
Restriction(s):  
Can enroll if Class is Senior  
Can enroll if Major is Biological Sciences

BIOL 492  Capstone Research Experience  3 Credit Hours
An approved research experience with a UM-D biology faculty member which integrates material from different subdisciplines of biology. Research results are reported in a poster or seminar presentation or in a manuscript submitted for publication.  
Restriction(s):  
Can enroll if Class is Senior  
Can enroll if Major is Biological Sciences
The Business Studies major is an optional second major for students pursuing a Bachelor of Arts or Bachelor of Science degree through the College of Arts, Sciences, and Letters (CASL).

The Business Studies major (BST) complements the critical thinking and acquired knowledge gained through a liberal arts and sciences education that provides a strong foundation in thinking creatively, seeing the world through a multi-perspective lens, and an understanding of diverse cultures and literary works.

The Business Studies major is open to non-College of Business students and must be pursued as a second major in conjunction with the primary major in CASL.

For further information about Business Studies as a Second Major, contact CASL Advising and Academic Success.

Prerequisites to the Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td></td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td></td>
</tr>
<tr>
<td>or MATH 109</td>
<td>Pre-Calculus</td>
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</tr>
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</table>

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS 301</td>
<td>Intro Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 305</td>
<td>Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 325</td>
<td>Probability</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 381</td>
<td>Prin of Stat and Exper Design</td>
<td>3</td>
</tr>
</tbody>
</table>

Track

<table>
<thead>
<tr>
<th>Select one of the following Tracks below</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Credit Hours</td>
<td>30</td>
</tr>
</tbody>
</table>

1 Some courses listed here may have additional prerequisites that could add to the total credit hours needed.

Business Studies as a Secondary Major

Business Studies as a Secondary Major

The Business Studies major is an optional second major for students pursuing a Bachelor of Arts or Bachelor of Science degree through the College of Arts, Sciences, and Letters (CASL).

The Business Studies major (BST) complements the critical thinking and acquired knowledge gained through a liberal arts and sciences education with foundational courses in business to develop the necessary leadership and analytical skills for careers in management related fields.

The BST graduate will acquire and possess a broad range of understanding, knowledge, and quantitative skills necessary for attaining a leadership role in business, education, community organizations, and government. Key to the BST is the comprehensive liberal arts and sciences education that provides a strong foundation in thinking creatively, seeing the world through a multi-perspective lens, and acquiring a broad based of knowledge, and an understanding of diverse cultures and literary works.

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### Communications Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 340</td>
<td>Professional Communication</td>
<td>3</td>
</tr>
<tr>
<td>or BA 330</td>
<td>Managerial Communication</td>
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</table>

Select two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COMM 220</td>
<td>Intro to Media &amp; Culture</td>
<td></td>
</tr>
<tr>
<td>COMM 260</td>
<td>Public Relations Principles</td>
<td></td>
</tr>
<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
<td></td>
</tr>
<tr>
<td>COMM 360</td>
<td>Social Media for PR</td>
<td></td>
</tr>
<tr>
<td>COMM 366</td>
<td>Public Comm and Culture Stdies</td>
<td></td>
</tr>
<tr>
<td>COMM 420</td>
<td>Critical Media Studies</td>
<td></td>
</tr>
<tr>
<td>COMM 460</td>
<td>Public Relations Campaigns</td>
<td></td>
</tr>
<tr>
<td>COMM 477</td>
<td>Prof Communication Ethics</td>
<td></td>
</tr>
<tr>
<td>MKT 458</td>
<td>Advertising</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 9

### Economics Concentration

Required – Three courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td></td>
</tr>
<tr>
<td>or ECON 302</td>
<td>Intermediate Microeconomics</td>
<td></td>
</tr>
<tr>
<td>BE 403</td>
<td>Business Conditions Analysis</td>
<td></td>
</tr>
<tr>
<td>or ECON 301</td>
<td>Intermediate Macroeconomics</td>
<td></td>
</tr>
<tr>
<td>ECON 311</td>
<td>Money and Banking</td>
<td></td>
</tr>
<tr>
<td>or FIN 443</td>
<td>Com Bank: Functn and Operatns</td>
<td></td>
</tr>
<tr>
<td>ECON/STS 321</td>
<td>Labor in the American Economy</td>
<td></td>
</tr>
<tr>
<td>ECON 331</td>
<td>Industrial Organization</td>
<td></td>
</tr>
<tr>
<td>ECON 335</td>
<td>Experimental Economics</td>
<td></td>
</tr>
<tr>
<td>ECON 433</td>
<td>Antitrust and Regulation</td>
<td></td>
</tr>
<tr>
<td>ECON 438</td>
<td>Beh Econ for Business &amp; Policy</td>
<td></td>
</tr>
<tr>
<td>ECON 447</td>
<td>International Finance</td>
<td></td>
</tr>
<tr>
<td>ECON 448</td>
<td>International Trade</td>
<td></td>
</tr>
<tr>
<td>ECON 4021</td>
<td>Economics of the Labor Sector</td>
<td></td>
</tr>
<tr>
<td>IB 441</td>
<td>International Financial Mgmt</td>
<td></td>
</tr>
<tr>
<td>IB 446</td>
<td>International Business</td>
<td></td>
</tr>
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</table>

**Total Credit Hours**: 9

### Entrepreneurship Concentration

Required:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
<td></td>
</tr>
<tr>
<td>ENT 401</td>
<td>New Venture Planning</td>
<td></td>
</tr>
<tr>
<td>ENT 402</td>
<td>Entrep, Corp Entrep &amp; Society</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 9

### Psychology Concentration

Required – Three courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRM 305</td>
<td>Human Resource Policy/Admin</td>
<td>9</td>
</tr>
<tr>
<td>MKT 382</td>
<td>Understanding Customers</td>
<td></td>
</tr>
<tr>
<td>PSYC 320</td>
<td>Social Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 363</td>
<td>Cognitive Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 3955</td>
<td>Diversity and the Workplace</td>
<td></td>
</tr>
<tr>
<td>PSYC 4305</td>
<td>Psychology in the Workplace</td>
<td></td>
</tr>
<tr>
<td>PSYC 464</td>
<td>Applied Cognitive Psychology</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 9

### Chemistry (ACS Certified)

The Bachelor of Science in Chemistry at the University of Michigan-Dearborn is fully accredited by the American Chemical Society (ACS). This program is designed primarily for students who intend to go into Chemistry as a profession or who plan to continue their studies at the graduate level. A student may earn a Bachelor of Science degree in chemistry by completing the prerequisite, major, and cognate courses and by fulfilling the Dearborn Discovery Core (DDC) and graduation requirements.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

### Foundational Studies

**Written and Oral Communication (GEWO)** – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

**Upper Level Writing Intensive (GEWI)** – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

**Quantitative Thinking and Problem Solving (GEQT)** – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

**Critical and Creative Thinking (GECC)** – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

### Areas of Inquiry

**Natural Science (GENS)** – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits

Humanities and the Arts (GEHA) – 6 Credits

Intersections (GEIN) – 6 Credits

Capstone (GECE) – 3 Credits

Foreign Language Requirement

Prerequisites to the Major

Major Requirements

Cognates

Students must complete at least six credit hours upper level (300+ level) from: Biology (BIOL), Biochemistry (BCHM), Environmental Science (ESCI), Geology (GEOL), Mathematics (MATH), Microbiology (MICR), Statistics (STAT), or Physics (PHYS). The six credit hours need not be from a single discipline.  

Total Credit Hours 37
CHEM 493 is a capstone portfolio course that requires data from various courses throughout the CACS curriculum. Students should discuss requirements with a Chemistry faculty mentor at the earliest opportunity and be aware of the benchmarks of the CHEM 493 course so that requirements will be completed by their final semester when they will register for CHEM 493.

Excluding MATH 385, MATH 386, MATH 387, MATH 391, MATH 442, MATH 443, MATH 444, MATH 445, MATH 446, MATH 447, MATH 449, MATH 486. Only one of STAT 301 or STAT 325.

Notes:

1. A maximum of 44 hrs. in CHEM (excluding CHEM 134, CHEM 136, CHEM 144, CHEM 146) may count in the 120 required for graduation.
2. At least 12 of the 31 upper level hours in CHEM must be elected at UM-Dearborn.
3. CHEM 470 and CHEM 471 can be used in place of CHEM 370, however, CHEM 470 alone cannot be used for this substitution. Students cannot take both CHEM 370 and CHEM 470 or CHEM 471 or any combination to fulfill major, cognate or minor requirements.
4. A maximum of 6 hrs. of independent study/research in any Dept. of Natural Sciences discipline may count towards the 120 hours required to graduate.

Minor or Integrative Studies Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in chemistry (CHEM). A maximum of one credit hour of independent study/research may be used to fulfill the requirement (CHEM 495, CHEM 498, CHEM 499)

Chemistry (Instructional Track)

The Bachelor of Science in Chemistry (instructional track) is an interdisciplinary program for students who wish to teach chemistry and other science courses at the secondary school level. The program meets State of Michigan requirements as well as American Chemical Society (ASC) recommendations for teaching chemistry in high school. A student may earn a Bachelor of Science degree in Chemistry and qualify for a Michigan Secondary Standard Teaching Certificate by completing the professional sequence of education courses including one semester of directed teaching; by completing the prerequisite, major, cognate requirements and by fulfilling the Dearborn Discovery Core (DDC) graduation requirements. Students must also complete at least 100 credit hours of non-education courses; have a minimum 2.75 overall GPA; have a 2.75 or better GPA in their teaching major and in education courses; and have a 2.75 in their optional teaching minor, if desired. Students must take the Michigan Test for Teacher Certification (MTTC) prior to being recommended for a Michigan teaching certificate.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

· Lecture/Lab Science Course
· Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language I and II</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient Greek I and II</td>
<td>MCL 105 and MCL 106</td>
</tr>
<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
</tr>
<tr>
<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
</tr>
<tr>
<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
</tr>
<tr>
<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
</tr>
<tr>
<td>German I and II</td>
<td>GER 101 and GER 102</td>
</tr>
<tr>
<td>Latin I and II</td>
<td>LAT 101 and LAT 102</td>
</tr>
<tr>
<td>Spanish I and II</td>
<td>SPAN 101 and SPAN 102</td>
</tr>
</tbody>
</table>

Prerequisites to the Major

Chemistry/Instructional Track majors must complete 40 credit hours of prerequisite courses. These courses should be completed early in the student’s curriculum.
### Major Requirements

Students must complete 20 credit hours of upper-level chemistry courses as indicated:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 134 &amp; CHEM 136</td>
<td>General Chemistry IA and General Chemistry IIA (OR)</td>
<td>8</td>
</tr>
<tr>
<td>CHEM 144 &amp; CHEM 146</td>
<td>Gen Chemistry IB and General Chemistry IIB</td>
<td></td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 227</td>
<td>Organic Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>4</td>
</tr>
<tr>
<td>or BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 205</td>
<td>Calc III for Engin Students</td>
<td></td>
</tr>
<tr>
<td>PHYS 150 &amp; PHYS 151</td>
<td>General Physics I and General Physics II</td>
<td>8</td>
</tr>
</tbody>
</table>

Total Credit Hours 40

1 Students interested in biochemistry should elect BIOL 140; students interested in environmental chemistry should elect BIOL 130.

2 The physics prerequisite may also be satisfied by completing PHYS 125 and PHYS 126 and an upper-level physics course, such as PHYS 305. The upper level PHYS course used in this substitution cannot be used toward the cognate requirement.

### Education Requirements

Please see the College of Education, Health, and Human Services (CEHHS) section of this Catalog for secondary certification requirements. (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/undergraduate-degree-programs/secondary-grades-6-12-certification/)

### Teaching Minor Requirements

In order to obtain teaching certification, a student must complete the requirements for a teaching minor. Courses used to satisfy requirements for the minor and prerequisite may not be used to satisfy cognate or major requirements.

Teaching minors are available in mathematics, physical science, physics, and biology. Students should consult the College of Education, Health, and Human Services section in this Catalog for coursework requirements to complete the teaching minor (https://umdearborn.edu/cehhs/)
CHEM 090  Introduction to Chemistry  3 Credit Hours
An introductory course in chemistry stressing fundamental principles of chemistry and the application of mathematics to chemistry and problem-solving. Topics will include chemical formulas and equations, stoichiometry, descriptive inorganic chemistry, behavior of gases and atomic structure. Students with high school chemistry and three years of high school mathematics should elect CHEM 114. Three hours lecture. (F).

CHEM 091  Introduction to Chemistry II  3 Credit Hours
The course is designed for the Chemistry 134/144 student whose background in chemistry is inadequate for success in 134/144. This course will be offered concurrently with Chem 090 (Introduction to Chemistry). It will begin after the first Chem 134/144 exam and will encompass the final nine weeks of the term. Topics will include chemical formulas and equations, stoichiometry, descriptive inorganic chemistry, behavior of gases, and atomic structure.

CHEM 100  Chemistry and Society  4 Credit Hours
An introductory course for nonscientists that examines the way chemistry impacts our world. The course will focus not only on what modern chemistry has accomplished, but more generally on the way scientists think and how they function. Selected topics include (a) air and water pollution, ozone layer, global warming, acid rain, and other environmental chemistry; (b) the chemistry of plastics and polymers; (c) the chemistry of drugs and medicines; and (d) biotechnology and genetic chemistry. Other topics include the influence of the media on scientific issues and the decision-making process in science. Three hours lecture, three hours lab. (YR).

CHEM 124  General Chemistry I  4 Credit Hours
An introduction to phenomena and principles of chemistry with emphasis on developing an understanding of the fundamentals of chemical processes. Concepts to be explored are chemical reactions, thermodynamics, equilibria, and kinetics. For students considering careers in life sciences, physical sciences and engineering. Three hours lecture, one hour recitation, three hours laboratory. Prerequisites are one year of high school chemistry and previous or concurrent enrollment in MATH 104 or 105. (F,W,S).
Prerequisite(s): MATH 104* or MATH 105* or Mathematics Placement with a score of 113
Corequisite(s): CHEM 124L

CHEM 134  General Chemistry IA  4 Credit Hours
An introduction to chemical phenomena and principles with an emphasis on developing both an understanding of chemistry and an appreciation of what chemists do. Students will investigate the fundamentals of chemistry in the context of real-world problems and will utilize systems of biological and environmental importance. Core concepts include stoichiometry, aqueous chemistry, gas laws, thermochemistry, atomic structure, molecular structure and bonding. Three hours lecture, one hour recitation, three hours laboratory. Primarily designed for students considering careers in life sciences or physical sciences. (F,W,S)
Prerequisite(s): MATH 104* or MATH 105* or MATH 113* or MATH 115* or Mathematics Placement with a score of 105 or Mathematics Placement with a score of 115

CHEM 136  General Chemistry IIA  4 Credit Hours
Continuation of CHEM 134. Concepts explored include conceptual and quantitative treatments of intermolecular forces, physical properties of solutions, chemical kinetics, chemical equilibria, acid-base equilibrium, thermodynamics, and electrochemistry. Primarily designed for students majoring in the physical sciences and the life sciences. (F,W,S)
Prerequisite(s): CHEM 134

CHEM 144  Gen Chemistry IB  4 Credit Hours
This course consists of an introduction to chemistry, its phenomena, and principles explored in the context of real-world examples (e.g. the automobile). Core concepts include states of matter, atomic and electronic structure, types of reactions (acid-base and reduction-oxidation), structure and bonding, gas laws, stoichiometry, thermodynamics, chemical equilibrium, and the chemical composition of the atmosphere and air pollution problems. Three hour lecture, one hour recitation, three hours laboratory. Primarily designed for students considering careers in engineering. (F)
Prerequisite(s): MATH 105* or Mathematics Placement with a score of 113 or Mathematics Placement with a score of 115
Corequisite(s): CHEM 144L

CHEM 146  General Chemistry IIB  4 Credit Hours
Continuation of CHEM 144. This course consists of an introduction to chemistry, its phenomena, and principles explored in the context of real-world examples (e.g. the automobile). Core concepts to be explored include the solid state, chemical kinetics, electrochemistry and its applications (e.g. batteries, fuel cells, and corrosion), an introduction to organic functional groups, their reactions, and spectroscopic identification, and the preparation and properties of synthetic polymers. Primarily designed for students considering careers in engineering. (W)
Prerequisite(s): CHEM 144

CHEM 225  Organic Chemistry I  3 Credit Hours
The initial course in organic chemistry. A general introduction to organic chemistry with emphasis on the development of structure theory and functional group chemistry. Three hours lecture, one hour recitation. (F,S).
Prerequisite(s): CHEM 136 or CHEM 146
Corequisite(s): CHEM 225R

CHEM 225R  Organic Chemistry I Recitation  0 Credit Hours
Recitation component of CHEM 225. Must be taken concurrently with CHEM 225.
Corequisite(s): CHEM 225

CHEM 226  Organic Chemistry II  3 Credit Hours
A continuation of CHEM 225. Topics include functional group chemistry and properties of carbohydrates, amino acids, and aromatic compounds. Three hours lecture, one hour recitation. CHEM 225 and 226 constitute a two-semester sequence in organic chemistry, suitable for students in the basic sciences or engineering or with interests in one of the health professions. (W,S).
Prerequisite(s): CHEM 225
Corequisite(s): CHEM 226R

CHEM 226R  Organic Chemistry II Rec  0 Credit Hours
Recitation component of CHEM 226. Must be taken concurrently with CHEM 226.
Corequisite(s): CHEM 226

CHEM 227  Organic Chemistry Laboratory  2 Credit Hours
Development of the basic laboratory techniques of organic chemistry. The chemistry of functional groups is studied and various organic compounds are synthesized and purified. Eight hours laboratory. (F,W,S).
Prerequisite(s): CHEM 226*
CHEM 228  Org Chem Lab for Chem/Bchm  2 Credit Hours
CHEM 228 incorporates chemical reactions and techniques for the synthesis, purification, and characterization of organic molecules. Students will conduct modern organic chemical experiments, collect data using modern instrumentation, analyze that data, and explain their reasoning in written and visual formats. Students will learn techniques to conduct multi-step synthesis, isolation, and purification of organic molecules and use modern techniques for molecular structure elucidation and to analyze pure samples and mixtures. This course is aimed at students majoring in chemistry or biochemistry. Students cannot receive credit for both CHEM 227 and CHEM 228. (FW)
Prerequisite(s): (CHEM 134 and CHEM 136) or (CHEM 144 and CHEM 146) and CHEM 225 and CHEM 226*
Restriction(s):
Can enroll if Major is Chemistry (ACS Certified), Biochemistry

CHEM 230  Org Chem Lab for Chem/Bchm  2 Credit Hours
CHEM 230 incorporates chemical reactions and techniques for the synthesis, purification, and characterization of organic molecules. Students will conduct modern organic chemical experiments, collect data using modern instrumentation, analyze that data, and explain their reasoning in written and visual formats. Students will learn techniques to conduct multi-step synthesis, isolation, and purification of organic molecules and use modern techniques for molecular structure elucidation and to analyze pure samples and mixtures. This course is aimed at students majoring in chemistry or biochemistry. Students cannot receive credit for both CHEM 227 and CHEM 230. (FW)
Prerequisite(s): (CHEM 134 and CHEM 136) or (CHEM 144 and CHEM 146) and CHEM 225 and CHEM 226*
Restriction(s):
Can enroll if Major is Chemistry (ACS Certified), Biochemistry

CHEM 285  Introduction to Glass Blowing  1 Credit Hour
A study of the nature, properties, and manufacture of glass. Laboratory experience in the manipulation of glass and the construction of scientific apparatus. Discussions, laboratory, and field trips. (AY).

CHEM 303  Inorganic Chemistry I  3 Credit Hours
A study of the chemistry of the elements and their periodic relationship. Bonding theories and structures as well as descriptive chemistry of the representative elements will be emphasized. Three hours lecture. (F).
Prerequisite(s): CHEM 136 or CHEM 146

CHEM 325  Principles of Organic Chem  3 Credit Hours
A one-semester introduction to the compounds of carbon, with an emphasis on structure, preparation, reactivity and characterization of different functional groups. Both aliphatic and aromatic compounds will be examined. The important role of organic compounds in modern society will be highlighted with real world examples including fuels, detergents, plastics, medicines, biomolecules, environmental pollutants and additives. This course may not be used to satisfy the organic chemistry prerequisite for the Biochemistry, Biology, Chemistry, or Microbiology degree programs. Students may not receive credit for both CHEM 225 and 325. CHEM 325 may not be used as a prerequisite for Chemistry 226.
Prerequisite(s): CHEM 124 and (CHEM 136 or CHEM 146)
Restriction(s):
Cannot enroll if Major is Microbiology, Chemistry (ACS Certified), Chemistry (Instructional), Biochemistry, Biological Sciences

CHEM 344  Quantitative Analysis  4 Credit Hours
A survey of theory and practice of volumetric, gravimetric, electrometric and colorimetric analysis. Systematic analysis of complex materials. Two hours lecture, eight hours laboratory. (F).
Prerequisite(s): CHEM 136 or CHEM 146
Corequisite(s): CHEM 344L

CHEM 348  Environmental Chemistry  3 Credit Hours
Description of the concepts, principles, practices, and current problems in the chemistry of natural waters, the soil, and the atmosphere. Three hours lecture. (AY).
Prerequisite(s): CHEM 344 and (CHEM 225 or CHEM 325)

CHEM 349  Environmental Chem Laboratory  1 Credit Hour
Collection and analysis of air, water, soil, and organisms for pollutants such as noxious gases, heavy metals, and trace organics. EPA-approved methods are emphasized. Four hours laboratory. (AY).
Prerequisite(s): CHEM 348* or ESCI 348*

CHEM 352  Introduction to Toxicology  3 Credit Hours
An introduction to the principles of toxicology with an emphasis on environmental toxicology. Major topics include toxic agents, toxicological mechanisms, and use of toxicological reference literature. Discussion of chemical carcinogenesis, genetic toxicology, immunotoxicology, teratology, and toxic responses of the skin, eyes and nervous system. Three hours lecture. (AY).
Prerequisite(s): CHEM 225

CHEM 368  Physical Chemistry I  3 Credit Hours
Nature of the gaseous state, chemical thermodynamics, biochemical and chemical equilibria and kinetics. Three hours lecture, one hour discussion. (W).
Prerequisite(s): CHEM 225 and MATH 115 and (PHYS 125 or PHYS 150)

CHEM 370  Principles of Biochemistry  3 Credit Hours
A concise but comprehensive survey of various areas of biochemistry designed for non-biochemistry majors. The course follows the standard approach to the subject including a description of cells, their structure and constituent macromolecules (proteins, nucleic acids, carbohydrates and lipids), enzymology, bioenergetics, intermediary metabolism and gene regulation. Students cannot take both BCHM 370 and 470 or 471 for any combination of concentration, cognate or minor requirement. Three hours lecture. (F).
Prerequisite(s): BIOL 140 and CHEM 226

CHEM 390  Current Topics in Chemistry  1 to 3 Credit Hours
A course in special topics current to the field of chemistry. Topics and format for the course may vary. See current Schedule of Classes. One to three hours seminar. Permission of instructor. (OC).

CHEM 397  Current Topics in Chemistry  3 Credit Hours
A course for non-science majors which focuses on the interaction of chemistry and society. Sufficient chemical knowledge will be introduced so that the issues can be discussed and competing statements evaluated. Topics covered will include air and water pollution, fuels, designing drugs, etc. (OC).

CHEM 403  Inorganic Chemistry II  3 Credit Hours
A study of coordination and organometallic compounds through the use of current theories. The structure, reactivity, and descriptive chemistry of transition metal complexes will be examined. Three hours lecture. (W).
Prerequisite(s): CHEM 303 and (CHEM 368* or CHEM 468)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 426</td>
<td>Advanced Organic Chemistry</td>
<td>3</td>
<td>Spectral analysis, structure determination, reaction mechanisms, synthesis, stereochemistry, and other selected topics are discussed. Three hours lecture. (AY). Prerequisite(s): CHEM 226 and CHEM 227</td>
</tr>
<tr>
<td>CHEM 430</td>
<td>Bioorganic Chemistry</td>
<td>3</td>
<td>This course examines the roles that metals play in biological systems, including the chemical principles that make metal ions well-suited for roles in protein structure, in redox catalysis and in acid base chemistry. The physical and experimental techniques that are applied to explore the structure and function of metals in natural systems will be introduced using case studies from the primary scientific literature in the field. BCHM 370 or its equivalent are strongly recommended but not required. Prerequisite(s): CHEM 136 and BIOL 140</td>
</tr>
<tr>
<td>CHEM 435</td>
<td>Green Chemistry</td>
<td>3</td>
<td>An examination of green chemistry principles and methods used to assess and improve chemical processes with respect to environmental impact. Topics include: concepts of green chemistry, waste prevention, catalysis, renewable resources, alternative energy resources, and green technologies. Prerequisite(s): CHEM 226 or CHEM 325 Restriction(s): Cannot enroll if Class is Graduate</td>
</tr>
<tr>
<td>CHEM 436</td>
<td>Polymer Chemistry</td>
<td>3</td>
<td>The macromolecular concept is introduced and polymerization mechanisms are discussed. The chemistry and physical properties of representative polymeric materials are presented. Topics include the determination and distribution of molecular weights, polymer morphology, mechanical properties of polymers, relaxation phenomena in polymers, and methods of polymer characterization. Three hours lecture. (AY). Prerequisite(s): CHEM 226 and (CHEM 368* or CHEM 468)</td>
</tr>
<tr>
<td>CHEM 437</td>
<td>Nano-Biotechnology</td>
<td>3</td>
<td>An introduction to the fundamentals of nanotechnology, nano-fabrication processes and its application in different fields with special attention to the life sciences. This course introduces different tools used in nontechology and investigates how one can borrow the idea of self-assembly from nature to design structures at the nanometer scale. The course also focuses on different contemporary application areas of nanotechnology like biosensor development, cancer research and drug delivery. The research areas of selected companies that are applying nanotechnology to develop new products will also be explored. This course showcases the interchange of ideas between chemistry, materials science and engineering in solving complex biological problems. Prerequisite(s): (CHEM 136 or CHEM 146) and (PHYS 126 or PHYS 151) and BIOL 140 Restriction(s): Can enroll if Class is Junior or Senior</td>
</tr>
<tr>
<td>CHEM 444</td>
<td>Instrumental Methods of Analysis</td>
<td>4</td>
<td>A study of the theory, operation, and application of instrumental methods of chemical analysis including optical, magnetic, electrochemical, and separation techniques. Two hours lecture, eight hours laboratory. (W). Prerequisite(s): CHEM 368* or CHEM 468</td>
</tr>
<tr>
<td>CHEM 450</td>
<td>Adv Org Syn &amp; Character Lab</td>
<td>1</td>
<td>Concepts and techniques from previous laboratory courses as well as advanced techniques are applied to synthesis and characterization of organic compounds. Spectroscopic and chromatographic data collection and interpretation are critical to success in the course. Formal writing and data presentation is emphasized. Oral presentation and a poster presentation is required. Crossover experiments with CHEM 452 are likely. Four hours laboratory (W). Prerequisite(s): CHEM 227 and CHEM 226 and CHEM 447 and CHEM 468 Corequisite(s): CHEM 452</td>
</tr>
<tr>
<td>CHEM 452</td>
<td>Adv Inorg Synth &amp; Char Lab</td>
<td>1</td>
<td>Concepts and techniques from previous laboratory courses as well as advanced techniques are applied to the synthesis and characterization of inorganic compounds. The ability to collect and interpret spectroscopic data is an important aspect of the course. Technical writing and data presentation is emphasized. Oral presentation and a poster presentation is required. Crossover experiments with CHEM 450 are likely. Four hours laboratory. (W) Prerequisite(s): CHEM 226 and CHEM 227 and CHEM 136 and CHEM 403 and CHEM 447 and CHEM 481 Corequisite(s): CHEM 450</td>
</tr>
<tr>
<td>CHEM 469</td>
<td>Physical Chemistry II</td>
<td>3</td>
<td>Nature of the liquid state, simple mixtures, heterogeneous equilibria; quantum theory, atomic and molecular structure, spectroscopy; statistical thermodynamics. Three hours lecture, one hour discussion. (F). Prerequisite(s): CHEM 368</td>
</tr>
<tr>
<td>CHEM 470</td>
<td>Biochemistry I</td>
<td>3</td>
<td>Life processes from a chemical viewpoint: structure/function relationships of biomolecules, with emphasis on proteins, enzyme kinetics, and mechanisms of action. Three hours lecture. (W). Prerequisite(s): (BIOL 130 and BIOL 140 and CHEM 134) or (CHEM 144 and CHEM 136) or (CHEM 146 and CHEM 225)</td>
</tr>
<tr>
<td>CHEM 471</td>
<td>Biochemistry II</td>
<td>3</td>
<td>Intermediary metabolism, bioenergetics, energy transformation, metabolic interrelationships, biochemical regulation, highly structured subcellular biochemical systems. Three hours lecture. (W). Prerequisite(s): BCHM 470 or CHEM 470 or BIOL 470</td>
</tr>
<tr>
<td>CHEM 472</td>
<td>Biochemistry Laboratory I</td>
<td>1</td>
<td>The techniques of preparative and analytical biochemistry. Preparation and characterization of proteins and nucleic acids. Physical and chemical properties of proteins and nucleic acids. Four hours laboratory. CHEM 344 Recommended. (F). Prerequisite(s): (BIOL 470* or BCHM 470* or CHEM 470*) and CHEM 227</td>
</tr>
<tr>
<td>CHEM 473</td>
<td>Biochemistry Laboratory II</td>
<td>1</td>
<td>The techniques of preparative and analytical biochemistry. Preparation and characterization of lipids and carbohydrates. Methods in metabolism. Four hours laboratory. (W). Prerequisite(s): (BCHM 471* or BIOL 471* or CHEM 471*) and (BCHM 472* or BIOL 472* or CHEM 472*)</td>
</tr>
<tr>
<td>CHEM 481</td>
<td>Physicochemical Measurements</td>
<td>2</td>
<td>Laboratory work including the determination of molecular weights, measurements of properties of pure liquids and solutions, studies of phase equilibria, thermochemical measurements, and analysis of atomic and molecular spectra. Eight hours laboratory. (W). Prerequisite(s): CHEM 469*</td>
</tr>
</tbody>
</table>
CHEM 490  Topics in Chemistry  1 to 3 Credit Hours
Examination of problems and issues in selected areas of chemistry. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. One to three hours lecture. (YR).
Prerequisite(s): CHEM 226
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

CHEM 490D  Topics in Chemistry  3 Credit Hours
Topic: Bioinorganic Chemistry. Introduces the roles metals play in biological systems. Explores chemical principles that make metals particularly well suited for these roles. Introduces physical and experimental techniques used to explore the structure and function of metals in natural systems. Explores case studies from the literature to synthesize results of various experiments to develop a final understanding of the systems. Students will not receive credit for both CHEM 490D and 590B.
Prerequisite(s): CHEM 226 and BIOL 140

CHEM 493  Chemistry Capstone Portfolio  1 Credit Hour
Employment or graduate studies in chemistry involve integration of experiences and knowledge from one's undergraduate courses. This course is designed to help prepare students for their professional endeavors beyond UM-Dearborn. Students will submit a proposal for a senior project, present the completed project in an appropriate forum, and submit a written report on the project. Students will assemble and present a professional portfolio, and complete an exit interview. The experimental work on the project may be done in an advanced laboratory course or an independent study. (F, W).
Restriction(s):
Can enroll if Class is Senior

CHEM 495  Off-Campus Research Participat  1 to 3 Credit Hours
Participation in ongoing experimental research at an off-campus laboratory. Arrangements made between the research laboratory, the student and the chemistry concentration advisor. No more than six hours combined from CHEM 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F, W, S).

CHEM 497  Seminar in Chemistry  1 Credit Hour
Weekly seminars on topics of current chemical interest presented by faculty members, guest lecturers or students. The subject will vary from term to term. The course may be elected up to three times. One hour seminar. (W).
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate
Cannot enroll if Major is Chemistry (Instructional), Chemistry (ACS Certified)

CHEM 498  Readings in Chemistry  1 to 3 Credit Hours
Library research in a specific area of chemistry performed under the guidance of a faculty member. No more than six hours combined from CHEM 495, 498 and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours of readings. Permission of instructor. (F, W, S).

CHEM 499  Laboratory Research in Chem  1 to 3 Credit Hours
Directed laboratory research performed under the guidance of a faculty member. No more than six hours combined from CHEM 495, 498 and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of instructor. (F, W, S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Communication
The Bachelor of Arts in Communications emphasizes three interrelated areas of public relations and organizational cultures, public advocacy and democratic cultures, and intercultural/international communication and global cultures. Each area has a practical focus in which written and oral communication skills and interpersonal awareness are developed; in addition, the communication degree is designed to emphasize the intellectual, historical, and critical perspectives emerging from the intersections between and among these larger areas of communication inquiry. This “triadic” approach presents communication as a challenging, creative skill to be mastered, and, moreover, as an integral process through which democratic and professional possibilities are shaped and social realities constructed.

A prominent emphasis on culture and community connects disciplinary work in communication with the integrative understanding of people’s needs and interests that characterizes the best work in anthropology, sociology, psychology, economics, and political science. The program combines this strong theoretical foundation with the practical skills training to prepare students for any number of opportunities in our globalized multicultural and highly technological environment.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

Ancient Greek I and II MCL 105 and MCL 106
Arabic I and II ARBC 101 and ARBC 102
Armenian I and II MCL 111 and MCL 112
Chinese I and II CHIN 101 and CHIN 102
French I and II FREN 101 and FREN 102
German I and II GER 101 and GER 102
Latin I and II LAT 101 and LAT 102
Spanish I and II SPAN 101 and SPAN 102

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEE 101</td>
<td>Principles of Speech Comm</td>
<td>3</td>
</tr>
<tr>
<td>COMM 220</td>
<td>Intro to Media &amp; Culture</td>
<td>3</td>
</tr>
<tr>
<td>COMM 366</td>
<td>Public Comm and Culture Stdies</td>
<td>3</td>
</tr>
</tbody>
</table>

Required Core Area I

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 366</td>
<td>Public Comm and Culture Stdies</td>
</tr>
</tbody>
</table>

Required Core Area II
Select 2 courses from each of the following areas:

Public Relations and Organizational Culture Focus (CAPR). Two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 260</td>
<td>Public Relations Principles</td>
</tr>
<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
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<td>COMM 340</td>
<td>Professional Communication</td>
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<td>Social Media for PR</td>
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<td>COMM 390</td>
<td>Topics in Communication</td>
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<td>COMM 450</td>
<td>Principle of Organization Comm</td>
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<tr>
<td>COMM 460</td>
<td>Public Relations Campaigns</td>
</tr>
<tr>
<td>COMM 477</td>
<td>Prof Communication Ethics</td>
</tr>
</tbody>
</table>

International/Intercultural Communication and Global Culture Focus (CAIG). Two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
</tr>
</tbody>
</table>
Cognate

Must be an upper level course from any CASL discipline (excluding Communication (COMM) and Speech (SPEE), and MATH 385, MATH 386, MATH 387).

Required Experiential Education

Humanities Internship, Co-op, or Senior Thesis 2 3

Total Credit Hours 39

Notes:

1. A maximum of 63 hrs of COMM and SPEE may count toward the 120 hrs required for graduation.
2. At least 15 of the 27 upper level hours in the COMM major must be elected at UM-D.

Minor or Integrative Studies Concentration Requirements

A minor or concentration in Communication consists of 12 credit hours of approved upper-level courses in COMM/SPEE. In addition, students must complete one of the prerequisites listed below.

Prerequisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 220</td>
<td>Intro to Media &amp; Culture  or SPEE 101</td>
<td>3</td>
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<tr>
<td></td>
<td>Principles of Speech Comm</td>
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<td>Total Credit Hours</td>
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Courses for the Minor or Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
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Public Relations & Organizational Culture

Choose one course from (CAUL): 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
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<td>COMM 340</td>
<td>Professional Communication</td>
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<tr>
<td>COMM 360</td>
<td>Social Media for PR</td>
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<td>COMM 365</td>
<td>Health Communication</td>
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<tr>
<td>COMM 460</td>
<td>Public Relations Campaigns</td>
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</table>

International/Intercultural Communication & Global Culture

Choose one course from (CAIG): 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
<td></td>
</tr>
<tr>
<td>COMM 390</td>
<td>Topics in Communication</td>
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<tr>
<td>COMM 420</td>
<td>Critical Media Studies</td>
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<tr>
<td>COMM 430</td>
<td>International Communications</td>
<td></td>
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<tr>
<td>COMM/WGST 455</td>
<td>Gender and Media Studies</td>
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<tr>
<td>COMM/ANTH/SOC/WGST 481</td>
<td>Gender and Globalization</td>
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<tr>
<td>SPEE 310</td>
<td>Interpersonal Communication</td>
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Public Advocacy & Democratic Culture

Choose one course from (CAAD): 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 306/AMST 300/ENGL 306/HIST/SOC 306</td>
<td>Comparat. American Identities</td>
<td></td>
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<td>COMM 365</td>
<td>Health Communication</td>
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<tr>
<td>COMM 420</td>
<td>Critical Media Studies</td>
<td></td>
</tr>
<tr>
<td>COMM/WGST 455</td>
<td>Gender and Media Studies</td>
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<tr>
<td>JASS 380</td>
<td>History of American Journalism</td>
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<tr>
<td>SPEE 320</td>
<td>Public Argument and Advocacy</td>
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<tr>
<td>SPEE 330</td>
<td>Argumentation and Debate</td>
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<tr>
<td>SPEE 340</td>
<td>Persuasion &amp; Social Movements</td>
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<tr>
<td>SPEE 430</td>
<td>Small Group Communication</td>
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<tr>
<td>SPEE/COMM 442</td>
<td>20th Century Public Argument</td>
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</tbody>
</table>

Select one additional course from any of the core areas above: (Public Relations & Organizational Culture (CAUL); International/Intercultural Communication & Global Culture (CAIG); Public Advocacy & Democratic Culture (CAAD).

COMM 220 Intro to Media & Culture 3 Credit Hours

Full Course Title: Introduction to Media and Culture: Course focuses on the role of media as cultural institutions that both maintain and challenge power structures. Includes critical analyses of media such as television, music, film, internet, and print publications, as well as emerging technologies. Course examines media as being shaped by but also shaping cultural, economic, legal, political and other aspects of society. Considers the role of media in a democracy, as crucial forums for the deliberation of pressing issues, and as key sites for the creation of meaning.

Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280
COMM 260  Public Relations Principles  3 Credit Hours
Explores how public relations, as an area of communications management and production, can contribute to an organization’s success. Provides a comprehensive introduction to the field of public relations, including: history and contemporary professional status of the public relations practitioner; role of public relations as a management discipline; major areas of public relations work, including media relations, public affairs, issues management, lobbying, organizational relations, development; techniques of public relations production - planning and presentation - with attention to the uses of specific tools available to practitioners, i.e., news releases, brochures, multimedia, Internet communications, special events. (F,W,S).
Prerequisite(s): COMM 220

COMM 290  Communications Practicum  3 Credit Hours
COMM 290 (Practicum) provides introductory instruction and practice in a number of practical communications skills, with the field and focus changing each time the course is offered. (AY).
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMM 300  Communication Research Methods  3 Credit Hours
Gives detailed view of landmark research studies in the field. Acquaints students with logic of research inquiry, design and analysis, including questions of validity, reliability, causation, etc. Imparts basics of various research methods used in the communication field, such as survey interviews, depth interviews, focus groups, content analysis, and rhetorical analysis. Students design and conduct at least one study in communication, individually or in groups. (AY).
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMM 306  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic, and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity, and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience.
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280
Restriction(s): Can enroll if Level is Undergraduate

COMM 317  Case Studies in Tech Writing  3 Credit Hours
COMM 317 offers both practical and conceptual studies in technical writing and is open to non-technical as well as technical students. The course offers in-depth treatment of the communication problems and various document designs common to technical writing professionals. Instructional format includes lectures and discussions based on case material derived from actual events, followed up by preparation of written documents. Topics include document design, language barriers, and the role of the technical documents in product liability. (F,W,S).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s): Can enroll if Class is Junior or Senior or Graduate

COMM 340  Professional Communication  3 Credit Hours
Course covers essential skills of professional written and oral communication within the organization; the purpose, process, and problems of professional communication; the influence of organizational structure; audience analysis; the writing and editing of reports (formal and informal, including memo reports) and of professional correspondence; the preparation of graphics; and the planning and delivery of oral presentations. May count toward Communications minor. (F,W,S).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s): Can enroll if Class is Junior or Senior or Graduate

COMM 360  Social Media for PR  3 Credit Hours
This course explores the emerging social media technologies and studies their application in contemporary PR practice. It examines the nature and role of social media in organizations and explores technologies including blogs, Microblogs, collaboration tools, podcasts, viral video, social bookmarking, mobile platforms, and other evolving technologies.
Prerequisite(s): COMM 260
Restriction(s): Cannot enroll if Class is Freshman

COMM 364  Writing for Civic Literacy  3 Credit Hours
In Writing for Civic Literacy, students will study how politicians, the media and critical citizens use language to engage with the broader community. Students themselves will learn to use language to become more active, well-informed citizens. They will study rhetorical awareness, audience analysis and persuasive writing techniques and put those lessons to use in community settings. They will perform community service at agencies of their choosing and use those experiences as objects of analysis, researching the social context in which those agencies operate and writing analytically about the agencies. Further, students will synthesize classroom lessons and real-world experience by executing writing tasks for and with the agencies (these tasks might include editorials for the local press, informational webpages and fundraising materials).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

COMM 365  Health Communication  3 Credit Hours
Provides skills necessary for creating, interpreting, and critically evaluating messages about issues related to health and illness and encouraging active participation in healthcare. Examines theory and research regarding messages related to physical, mental, and social well-being from interpersonal, organizational, and mass communication approaches. (W, YR)
Restriction(s): Can enroll if Class is Junior or Senior

COMM 366  Public Comm and Culture Stdies  3 Credit Hours
This gateway course provides the theoretical and methodological foundation to embark on the study of three key interrelated spheres of communication: Public and Organizational Culture, Public Advocacy and Democratic Culture, and Intercultural Communication and Global Culture. Students will have the opportunity to examine salient societal issues within each of the major areas, and explore connections between the different areas. Through a variety of class exercises and both individual and collaborative projects, the course will help students to acquire an analytical and practical "toolkit" enabling them to function effectively as communicators in culturally diverse organizations and civic contexts.
COMM 381 Postwar European Cinema  
3 Credit Hours
The course will concentrate on a series of films from various European countries with a focus on the socio-political issues, historical events and cultural preoccupations that have defined and also challenged European societies from WWII to the present. Zeroing in on the construction of European identities, the course will analyze and compare modes of narrating national, class, racial, sexual and social differences in different European nations. Themes such as memories of war and the Holocaust, new conflicts, class, immigration, women’s rights, gender, and East-West relations will be addressed. The course will thus privilege a cinema that offers a “récit,” a story. Particular attention will be given to discourses on otherwise and on the ways in which film culture has reflected, reinforced, reshaped and, in some instances, contested Europe’s past and current dominant ideologies, and identities. Readings by cultural historians and analysts will provide the context for an understanding of the films. The course will conclude with a discussion of the possible existence of a specific postwar European Cinema.

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

COMM 390 Topics in Communication  
3 Credit Hours
A course in nonfiction narrative that focuses on memoir writing, emphasizing technique. Students will read book-length examples by Azar Nafizi, Nelson Mandela, Frank Conroy, Mar Karr, Susanna Kaysen, Frank McCourt, Ann Patchett and Joan Didion, examining these books as models for writing.

COMM 397 Communications Thesis  
3 Credit Hours
A thesis project that is the culmination of the Communications major. Students will choose the project area and write a thesis (40-50 pages) under the direction of a Communications faculty member. The thesis option is available only to students with substantial practical experience in the communication field, and requires the approval of Communications faculty.

Restriction(s):
Can enroll if Class is Junior or Senior

COMM 398 Independent Studies-Comm  
1 to 3 Credit Hours
Readings, supervised practice, or analytical assignments in Communications, determined in accordance with the needs and interests of those enrolled. May count toward Communications minor. (F,W).

COMM 420 Critical Media Studies  
3 Credit Hours
Course presents various critical approaches to the study of the media. Perspectives include political economy, cultural studies, critical theory of the Frankfurt school and feminism. Through readings and first hand analysis of the media students will delve deeply into the institutional underpinnings, content, use and reception of media. There will be special emphasis on how broader economic, cultural and technological changes influence our experience of media in everyday life as creators, citizens, audiences and consumers.

Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

Restriction(s):
Can enroll if Class is Junior or Senior

COMM 422 Language and Popular Culture  
3 Credit Hours
This course provides an overview of popular culture theories and communication models along with research methods. It offers an accessible, in-depth presentation of popular culture including music, film, television, magazines, comics, animation, and advertising in the US and the beyond. The main focus of the course is to highlight the functions of language, particularly, dialects, accents, and foreign languages, in producing and consuming local and global pop culture texts.

Restriction(s):
Can enroll if Level is Undergraduate

COMM 430 International Communications  
3 Credit Hours
Course examines the relationship between globalization and communication from various vantage points such as cultural imperialism, global media flows, and hybridity theory. Students use these theoretical approaches to understand how people in particular locations experience, adapt, resist and modify globally circulating aspects of media, popular culture, news and information. Through critical responses to readings, class exercises, individual and team projects, students also explore how global pressures and changes influence the way people understand and project their identities, buy and sell communication as a commodity, negotiate borders, and create social change.

Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

Restriction(s):
Can enroll if Class is Undergraduate

COMM 442 20th Century Public Argument  
3 Credit Hours
This class is a survey of American public address in the 20th Century. Students will examine and critically analyze several of the most significant speeches and rhetorical movements of the last one hundred years. Through lectures, discussions, and analysis of speeches and other artifacts, we will focus on the relationship between rhetoric and history, and how theories of rhetorical action help us appreciate the role of discourse in the effective functioning of a democratic system. Students will learn to utilize several critical perspectives as a means of understanding both historical and contemporary political discourse. (W).

Prerequisite(s): SPEE 101

COMM 450 Principle of Organization Comm  
3 Credit Hours
Course examines how communication networks function in organizations. Purpose: to provide an organizational context and conceptual framework for the practice of professional writing and speaking skills. Writing projects include a research report, a case study, and several shorter papers, practical and analytical, on assigned topics. Students cannot receive credit for both COMM 450 and COMM 550. (OC).

Prerequisite(s): COMM 340 or COMM 360 or COMM 440

Restriction(s):
Can enroll if Class is Junior or Senior
COMM 455  Gender and Media Studies  3 Credit Hours
The course will focus on several feminist approaches used in understanding the media and attempting to create social change through the media. The role of media in the definition and reproduction of gender-based hierarchies and in the renegotiation of gender boundaries will both be explored. To this end, both mainstream and women's media will be examined. The course will take a multicultural and international perspective, incorporating concerns of class, race, ethnicity, and nation as these intersect with the study of gender and media. Mainstream and alternative media will be analyzed through readings, films, case studies, in-class collaborative exercises and longer term projects. News, entertainment, and advertising genres will be examined in a variety of media such as the printed press, television, video, film, and the Internet. (W).
Prerequisite(s): WGST 275 or WGST 303 or ANTH 275 or PSYC 275 or SOC 275 or ANTH 303 or PSYC 303 or SOC 303 or HUM 275 or HUM 250 or WST 275
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

COMM 460  Public Relations Campaigns  3 Credit Hours
Focuses on strategies and tactics involved in planning and implementing a public relations campaign. Extends and refines skills acquired in earlier, prerequisite course work by incorporating management, production, and writing within a four-stage model for planning and action. This model provides a framework for role-playing, case study work, and projects done for evaluation by public relations professionals at local firms. The semester's portfolio of finished communications and "mock-ups" - including planning materials, news releases, brochures, newsletters, Internet communications, video and audio scripts - should demonstrate command of entry-level, professional abilities as a public relations campaign manager and producer. (YR).
Prerequisite(s): COMM 260 and (COMM 360 or COMM 440)

COMM 462  Transnational Rhetorics  3 Credit Hours
Full Course Title: Transnational Rhetorics: Writers Across Borders "Transnational Rhetorics" engages students in reading and writing stories that cross various forms or borders. These borders might be national, as in stories about immigration or displacement. Or, the borders might be more abstract, like the assumed borders between race, class, and gender, or even the possible barriers we perceive between personal experience and world events. In this course, we will read stories about people who reflect on these kinds of border-crossings. We will then take a rhetorical approach to these narratives and examine how they work, what similarities they share, and importantly, how they address their audiences. Then, we will then produce--in turn--our own border-crossing essays that attend to the same issues of audience, context, narrative, and creativity. (OC)
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280

COMM 464  Contemporary Rhetorical Theory  3 Credit Hours
An examination of contemporary rhetorical theories through study of representative practitioners and related developments in linguistics, philosophy, psychology, communication, and composition and rhetoric. Students may not receive credit for both COMM 464 and COMM 564.
Prerequisite(s): COMM 201 or COMM 220 or COMM 290 or ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250
Restriction(s):
Cannot enroll if Class is Graduate

COMM 466  Arguing Feminism: Rhetoric  3 Credit Hours
An introduction to the work of major twentieth century feminists working in rhetoric and related fields. Students examine recurring themes of language, meaning, ethics and ideology, and practice writing strategies which address rhetorical and ethical concerns central to feminist/ academic writing. (OC)
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Cannot enroll if Class is Freshman

COMM 477  Prof Communication Ethics  3 Credit Hours
An examination of professional communication ethics in the organizational context, focusing on important issues, problems, and concepts. This course is designed to help students become conscious of the role of values in a wide range of professional communication situations; to locate organizational behavior in an ethical framework based on considered definitions, standards, perspectives, and criteria for evaluation and analysis; to consider individuals as well as organizations as moral agents in a changing and complex universe; and to analyze topical cases on emergent issues in communication ethics. Some sample topics: ethics in decision-making and conflict-resolution; privacy and confidentiality; sexual harassment; whistleblowing; the "engineering" of consent; corporate image and ethos; issues in documentation, record-keeping, and technology; "issues management" and corporate responsibility; groupthink; obedience and personal responsibility; employee socialization. Students cannot receive credit for both COMM 477 and COMM 577. (OC).
Prerequisite(s): COMM 340 or COMM 360 or COMM 440 or COMM 450
Restriction(s):
Can enroll if Class is Junior or Senior

COMM 481  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reframes identities and locations and the political possibilities they create. (AY).
Prerequisite(s): HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Community Change

Minor or Integrative Studies
Concentration Only

The Community Change Studies (CCS) minor or concentration prepares students to fill the need for talented, skilled individuals to work on issues of poverty, race and community-building.

Our interdisciplinary approach offers students the tools to be critical thinkers, team builders, organizers and agents of positive, social change in a range of careers and in their lives.

Students work on local and campus issues, and explore topics such as social and political power; race, culture, class and gender; the history of social movements; and listening skills, relationship building and critical analysis.

A minimum of 18 credit hours of upper-level coursework is required

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>Required Core:</td>
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<tr>
<td>POL 334</td>
<td>Organizing and Leadership</td>
<td>6</td>
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<tr>
<td>URS 450</td>
<td>Sr Capstone in Community Rsrch</td>
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<tr>
<td>Select 3 credit hours of approved community-based research in any of the following: academic service learning course (ASL), independent study, internship.</td>
<td>9</td>
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<tr>
<td>AMST 300/COML  306/ENGL 306/HIST 3602/SOC 306</td>
<td>Comparat. American Identities</td>
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<td>ANTH 376</td>
<td>Power &amp; Privilege in SE Mich</td>
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<td>ANTH/CRJ 455/SOC 4555/WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
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<td>BA 320</td>
<td>Proj Mgmt &amp; Leadership Skills</td>
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<tr>
<td>COMM/COMP 364</td>
<td>Writing for Civic Literacy</td>
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<td>COMM 366</td>
<td>Public Comm and Culture Stdies</td>
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<tr>
<td>CRJ/ENST 483</td>
<td>Justice, Crime and Environment</td>
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<td>ECON/HIST 375</td>
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<td>ENST 456</td>
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<td>Women Leadership/Social Change</td>
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<td>HIST/AAAS 369</td>
<td>Civil Rights Movement in Amer</td>
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<td>HIST/STS 383</td>
<td>Labor in America</td>
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<td>HIST 384</td>
<td>Immigration in America</td>
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<td>POL/CRJ 323</td>
<td>Urban Politics</td>
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<td>POL 484</td>
<td>Revitalizing Cities</td>
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<td>SOC/CRJ 435</td>
<td>Urban Sociology</td>
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<tr>
<td>SOC 450</td>
<td>Political Sociology</td>
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</tbody>
</table>

Total Credit Hours 15

Please visit the Academic Service Learning (ASL) (https://umdearborn.edu/faculty-staff/hub-teaching-learning-resources/academic-service-learning/asl-courses/) webpage for approved ASL courses.

Comparative Literature

Comparative Literature is the study of literature from different nations and cultures, as written in translation rather than in the original languages.

Minor or Integrative Studies
Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in comparative literature (COML).

COML 221 Great Books I: Ancient World 3 Credit Hours
Introduction to masterpieces of Western world literature from the ancient world. Readings include the Bible, Iliad, Odyssey, Greek drama, and Roman authors. (YR).

COML 222 Great Books II 3 Credit Hours
Introduction to masterpieces of Western world literature from the Middle Ages and Renaissance. Readings include Dante, Chaucer, Wolfram, Cervantes, Shakespeare, Moliere, and Racine. (YR).

COML 223 Great Books III: Modern Era 3 Credit Hours
Introduction to masterpieces of Western world literature from the Modern Era. Readings include Swift, Voltaire, Rousseau, English romantic poets, fiction and drama of the 19th and 20th century. (YR).

COML 301 Literary Criticism 3 Credit Hours
This course introduces literary criticism and theory from Aristotle to the present, focusing on the changing concept of literature’s nature and function. Lectures, readings, and discussion cover such critics as Aristotle, Dryden, Pope, Johnson, Wordsworth, Coleridge, Arnold, T. E. Hulme, I. A. Richards, T. S. Eliot, and such movements as New Criticism, Phenomenology, Reader-Response, Archetypal Criticism, psychological approaches to literature, New Historicism, Marxism, Feminism, and Deconstruction. (OC).

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
COML 340  Modern European Short Fiction  3 Credit Hours
A careful reading of between 10 and 15 short novels (in English translation) with particular attention being paid to the manner in which their plots and characters express contemporary cultural issues. Such works as Dostoevsky’s Notes from Underground, Conrad’s Heart of Darkness, and Unamuno’s Abel Sanchez will be included.

Prerequisite(s): ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200

COML 341  Mod Eur Poetry in Translation  3 Credit Hours
Movements and genres of modern European poetry, from the Symbolists to the present. Included will be such poets as D’Annunzio, Cavafy, Rilke, Blok, Mayakovsky, Valery, Eluard, Pavese, Seferis, Akhmatova, Mandestram, Marinetti, Trakl, Mistrale, Vallejo, Morgenstern, Apollinaire, Loren, Transtromer, Brodszky, Milosz, and others in translation. (OC).

Prerequisite(s): ENGL 231

COML 344  Modern Literature: the Novel  3 Credit Hours
A careful examination of five or six significant modern novels in translation, with particular emphasis on their influence on the development of the novel, and their reflection of contemporary cultural issues. The works of such authors as Flaubert, Dostoyevsky, Tolstoy, Gide, Joyce, and Mann will be included.

COML 347  Clas Lit in Engl Translation  3 Credit Hours
A study of masterworks of ancient Greek and Roman literature with special attention to the development of epic, tragedy, comedy, and lyric poetry. Authors studied will include Homer, Virgil, Aeschylus, Sophocles, Euripides, Aristophanes, Terence, and Plautus.

Prerequisite(s): ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200

Restriction(s):
Can enroll if Class is Junior

COML 355  Urban Voices: France and Italy  3 Credit Hours
This course is an interdisciplinary approach to the concepts of urban development and literary, visual and cultural responses to the process of urbanization mainly in Rome and Paris. The readings will illustrate how the city shaped the writers’ creativity, as well as how their works interpret urbanization.

Restriction(s):
Can enroll if Class is Freshman

COML 375  The Hero in Literature  3 Credit Hours
Reflections on myth, history, and literature, based on analyses of literary texts. The individual hero may change from term to term. The course, for example, might center on the transition from Faust to anti-Faust. In this instance, some of the writers or works might include: The Faustbook, Marlow’s Doctor Faustus, Goethe’s Faust, Byron’s Manfred, a Faust opera, Thomas Mann’s Doktor Faustus, Gunter Grass’ The Tin Drum. All reading in English translation. (OC).

COML 390  Topics in Comparative Lit  3 Credit Hours
Examination of problems and issues in selected areas of comparative literature. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

COML 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in Comparative Literature in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor.

COML 404  Medieval Mystical Writers  3 Credit Hours
A study of the genre of mystical writing as it was developed and practiced throughout the Middle Ages and in 14th century England particularly. Attention will be given to the historical, religious, and cultural contexts that enabled and were created by mystical texts. In addition, the course will explore how traditional and contemporary trends in the fields of religious and literary studies can be brought to bear on the genre of mystical writing. (OC)

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

COML 433  Writing Women in Renaissance  3 Credit Hours
This course will be taught in English, and will focus on the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Ariosto. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe, and Marguerite de Navarre. At last issue will be women’s roles and women’s images in city and court culture during the early modern period, and the interaction of their writings with the literary canons of Italy and France. (OC).

Restriction(s):
Can enroll if Level is Undergraduate

COML 455  This American Life  3 Credit Hours
The course "This American Life: Immigrant Literature and the American Dream" is a literary and cultural analysis of the literature of immigration. The readings are from works of fiction in a variety of genres, and are written by American and non-American prize-winning authors. Their common denominator is the pursuit of the American Dream and its many multifaceted aspects. The themes explored include: assimilation, acculturation, diversity, language, subculture, intertextuality, nostalgia, belonging, and double identity. Student wishing to take this course for graduate credit should sign up for COML 555. Students cannot receive credit for both COML 455 and COML 555.

Restriction(s):
Cannot enroll if Class is Freshman or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Computer and Computational Mathematics

The courses in Computer and Computational Mathematics (CCM) develop skills in applying mathematical algorithms and scientific computing in real world situations.
Minor or Integrative Studies
Concentration Requirements

A minor or concentration consists of 12 hours of upper-level credit in courses specifically selected as CCM.

CCM 150  Computer Science I  4 Credit Hours
An introduction to structured computer programming covering problem formulation, algorithm development, the C++ programming language, program testing and debugging, capabilities and elements of computer organization, and object-oriented software methodologies.
Prerequisite(s): MATH 115*
Corequisite(s): CCM 150L

CCM 172  Computing Environ for Math  3 Credit Hours
This course covers introductory programming techniques for Mathematics majors. Students will learn to program in sage and python. Topics include data types, variables and assignments, decisions, loops, functions, recursion, arrays and objects. Programming assignments focus on problems that are mathematical in nature, giving students an opportunity to use simulations to understand and verify familiar mathematical results. This course, or CIS/CCM 150, satisfies the programming requirement for the Mathematics concentration.
Prerequisite(s): MATH 115
Restriction(s):
Can enroll if Class is Graduate

CCM 305  The Theory of Computation  3 Credit Hours
An introduction to the foundations of computer science including the theory of computability, Turing machines, automata, and formal languages.
Prerequisite(s): CIS 175 and (CIS 200 or IMSE 200)

CCM 315  Applied Combinatorics  3 Credit Hours
An introduction to methods and applications of enumerative and configurational combinatorics. Students study several elegant and useful techniques for counting and/or generating the elements in large and unwieldy finite sets. Students also study topics in graph theory that are applicable to real world problems. Topics include basic counting principles, the principle of inclusion-exclusion, generating functions and recurrence relations. Topics from graph theory include graph models, paths, circuits, cycles, and connectedness; additional topics include the theory and applications of planarity, coloring, directed graphs, networks and network flows.
Prerequisite(s): (MATH 200 or MATH 300) and (MATH 217 or MATH 227)

CCM 372  Computing with Mathematica  3 Credit Hours
The course explores a variety of topics from different areas of undergraduate mathematics including calculus, matrix algebra, number theory, geometry, and discrete mathematics. Students learn to design customized Mathematica functions to solve specific problems in these areas using the symbolic, computational, graphics, and programming tools provided within Mathematica.
Prerequisite(s): MATH 217 or MATH 227

CCM 390  Topics in Computational Math  1 to 3 Credit Hours
A course designed to offer selected topics in different areas of applied mathematics. The specific topics will be announced together with the prerequisites for each separate offering. Course may be repeated when the topics covered differ.

CCM 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in Computers and Computational Mathematics in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor.

CCM 404  Dynamical Systems  3 Credit Hours
The aim of this course is to survey the standard types of differential equations. This includes systems of differential equations, and partial differential equations, including for each type, a discussion of the basic theory, examples of applications, and classical techniques of solutions with remarks about their numerical aspects. Also included are autonomous and periodic solutions, phase space, stability, perturbation techniques and Method of Liapunov. (AY)
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)

CCM 451  Computer Graphics  3 Credit Hours
Basic geometrical concepts: graphics output primitives, two-dimensional transformations, windowing and clipping, three-dimensional viewing, visible surface detection methods, graphical user interfaces.
Prerequisite(s): (CCM 350 or CIS 350 or IMSE 350) or (ECE 370 and MATH 276) and (MATH 215 or MATH 205) and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

CCM 458  Introduction to Wavelets  3 Credit Hours
This course will introduce the students to theory and application of wavelets using linear algebra. Topics will include the discrete Fourier transform, the fast Fourier transform, linear transformations, orthogonal decomposition, discrete wavelet analysis, the filter bank, Haar Wavelet family, Daubechies’s Wavelet family, and applications. Students cannot receive credit for both MATH 458 and MATH 558. (OC)
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227
Restriction(s):
Can enroll if Class is Graduate

CCM 472  Intro to Numerical Analysis  3 Credit Hours
Solution of linear systems by Gaussian elimination, solution of nonlinear equations by iterative methods, numerical solutions of ordinary differential equations, data fitting with spline functions, numerical integration, optimization. (F).
Prerequisite(s): MATH 217 or MATH 227

CCM 473  Matrix Computation  3 Credit Hours
A study of the most effective methods for finding the numerical solution of problems which can be expressed in terms of matrices, including simultaneous linear equations, orthogonal projections and least squares, eigenvalues and eigenvectors, positive definite matrices, and difference and differential equations. (AY).
Prerequisite(s): MATH 217 or MATH 227

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Criminology and Criminal Justice

Criminology and Criminal Justice Studies is a field that focuses on the study of criminal behavior and society’s response to it.

The field draws upon the insights of the social and behavioral sciences, the physical sciences, statistics, and the humanities to illuminate
the issues of maintaining social order in a constitutional democracy committed to individual freedom, equality, and justice. The criminal justice system is composed of the police agencies, prosecutors, the legal profession, the courts, and correctional agencies, among others. The system is part of a larger social system which inevitably influences the effectiveness and fairness of criminal justice. Courses analyze system responses to changes in social structure and cultural values, and the reciprocal relationship between social values and the judicial system. The program in Criminology and Criminal Justice Studies at UM-Dearborn is intended to prepare students for careers in public security, criminal justice administration, law and paralegal professions, public administration, policy analysis, and graduate study in those fields.

Accelerated Program: 4+1 Option

The 4+1 Option (https://umdearborn.edu/casl/graduate-programs/programs/master-science-criminology-and-criminal-justice/41-option/) program allows current UM-Dearborn undergraduate Criminology and Criminal Justice majors to complete both the Bachelor of Arts and the Master of Science in Criminology and Criminal Justice in a format that offers substantial savings in both time and money. This is achieved by a double-counting allowance of up to 15 credits or 5 graduate level (500-level or above) courses. One additional year of graduate work (15-16 credits) would be needed to complete the Master’s program enabling students to earn two degrees in a total of five years.

Participation in the 4+1 program is limited to students who have completed at least 60 credit hours with a cumulative GPA of 3.0 or better. Admission to the 4+1 program is at the discretion of the Program Director and requires an admission interview. The "regular" online graduate application should be completed with a "Yes" response to the 4+1 accelerated program question. The only supplemental application materials required for 4+1 applicants are a personal statement describing career goals and a resume.

Once admitted to the 4+1 program, the student must attain a grade of B or better in each 500 level class elected. Failure to do so may result in removal from the 4+1 program. The courses to choose from are:

- CRJ 417/517 Crimmigration
- CRJ 453/553 Sociology of Law
- CRJ 465/565 Deviant Behavior
- CRJ 418/518 Criminal Justice Research methods
- CRJ 470/570 Current Issues in Criminal Justice
- CRJ 415/515 Principles of Restorative Justice
- CRJ 488/588 Criminal Procedure and the Constitution
- CRJ 409/509 Intelligence and Homeland Security
- CRJ 460/560 Law and Culture
- CRJ 466/566 Drugs, Alcohol and Society
- CRJ 482/582 Legal Ethics

For further information about the Accelerated 4+1 Program, please visit the CCJ 4+1 Option (https://umdearborn.edu/casl/graduate-programs/programs/master-science-criminology-and-criminal-justice/41-option/) webpage.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

- Ancient Greek I and II – MCL 105 and MCL 106
- Arabic I and II – ARBC 101 and ARBC 102
- Armenian I and II – MCL 111 and MCL 112
- Chinese I and II – CHIN 101 and CHIN 102
- French I and II – FREN 101 and FREN 102
- German I and II – GER 101 and GER 102
- Latin I and II – LAT 101 and LAT 102
- Spanish I and II – SPAN 101 and SPAN 102
### Prerequisites to the Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRJ 200</td>
<td>Intro to Criminal Justice</td>
<td>3</td>
</tr>
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### Major Requirements

#### Required Core Courses

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRJ 416/ POL 4165</td>
<td>Criminal Law</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 468</td>
<td>Criminology</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 482</td>
<td>Legal Ethics</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 478</td>
<td>Criminal Justice Internship</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 488</td>
<td>Criminal Procedure</td>
<td>3</td>
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<tr>
<td>One Class from:</td>
<td></td>
<td>3</td>
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<tr>
<td>CRJ 363</td>
<td>Crim Justice Syst and Policy</td>
<td></td>
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<tr>
<td>CRJ 480</td>
<td>Criminal Justice Theory</td>
<td></td>
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<tr>
<td>CRJ 489</td>
<td>Law, Crime, and Society</td>
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</tbody>
</table>

#### Special Topics in Criminal Justice (CAST)

Select two classes from the following: 6

- CRJ 408 Police and the Community
- CRJ 409 Intel and Homeland Security
- CRJ 417 Crimmigration
- CRJ 460 Law & Culture
- CRJ/SOC 466 Drugs, Alcohol, and Society
- CRJ/SOC 467 Drugs, Crime, and Justice
- CRJ/SOC 469 Juvenile Delinquency
- CRJ 470 Current Issues in Crim Justice
- CRJ 471 Int'l Criminal Justice Systems
- CRJ 472 Correctional Systems
- CRJ/SOC 473 Race, Crime and Justice
- CRJ 474 Cyber Crimes
- CRJ 475 Digital Evidence
- CRJ/SOC/ WGST 476 Inside Out Prison Exchange
- CRJ 480 Criminal Justice Theory
- CRJ 484 White Collar Crime
- CRJ 486 Criminalistics: CSI to Justice
- CRJ 487 Forensic Science
- CRJ 490 Topics in Criminal Justice

#### Social Justice and Social Control (CAJC)

Select two classes from the following: 6

- CRJ 363 Crim Justice Syst and Policy
- CRJ 408 Police and the Community
- CRJ 415 Restorative Justice
- CRJ 417 Crimmigration
- CRJ 443/ PSYC 405/ SOC 443/ WGST 405 Gender Roles
- CRJ/SOC/ WGST 447 Family Violence

#### Research Methods (CAQS)

Select one class from the following: 3-4

- CRJ/POL 300 Political Analysis
- CRJ/HPS/SOC 410 Quantitative Research
- CRJ 4130/ SOC 413 Qualitative Research Methods
- CRJ 418/518 Criminal Justice Research Methods

**Total Credit Hours** 33-34

Students admitted to the 4+1 Option may substitute 500 level course for 400 level course from the following (15 credits maximum):

- CRJ 417/517 Crimmigration
- CRJ 453/553 Sociology of Law
- CRJ 465/565 Deviant Behavior
- CRJ 418/518 Criminal Justice Research methods
- CRJ 470/570 Current Issues in Criminal Justice
- CRJ 415/515 Principles of Restorative Justice
- CRJ 488/588 Criminal Procedure and the Constitution
- CRJ 409/509 Intelligence and Homeland Security
- CRJ 460/560 Law and Culture
- CRJ 466/566 Drugs, Alcohol and Society
- CRJ 482/582 Legal Ethics

### Internship/Co-op Experience

An internship or co-op experience of 3 credit hours is required. The CRJ internship CRJ 478 provides supervised field experience in a variety of occupational agencies focusing on criminal justice and law enforcement. Each intern spends a minimum of 80 hours on site and attends a weekly seminar. Currently employed sworn federal, state, and local officers or agents may waive, through petition, the internship field experience. All students are required to register for and attend the weekly seminar.

#### Notes:

1. Any one course may be used to satisfy only **one** requirement within the major.
2. A maximum of 61 hrs. of CRJ can count toward the 120 hrs. required for graduation.
3. A maximum of 6 hrs. of internship (CRJ 478) credit may count in the minimum 33 hours for the major.
4. At least 15 of the upper level credit hours in CRJ must be elected at UM-D.
5. Some upper level CRJ courses may require SOC 200 or SOC 201, or PSYC 101.
6. Only 6 credit hours of academic transfer credit will be accepted for completion of police academy training programs meeting the standards of the Michigan Commission on Law Enforcement.

**Minor or Integrative Studies**
**Concentration Requirements**
The minor or concentration consists of the following courses:

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<tr>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>CRJ 416/408/4165</td>
<td>Criminal Law</td>
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</tr>
<tr>
<td>CRJ 468</td>
<td>Criminology</td>
<td>3</td>
</tr>
<tr>
<td>Select two courses from the following (CACR):</td>
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<td></td>
</tr>
<tr>
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<td>Crim Justice Syst and Policy</td>
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<td>CRJ 418</td>
<td>CJ Research Methods</td>
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<td>Current Issues in Crim Justice</td>
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<tr>
<td>CRJ 471</td>
<td>Int'l Criminal Justice Systems</td>
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<tr>
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<td>Correctional Systems</td>
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<tr>
<td>CRJ 489</td>
<td>Law, Crime, and Society</td>
<td></td>
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<tr>
<td>Total Credit Hours</td>
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<td>15</td>
</tr>
</tbody>
</table>

**Evening and Saturday Offerings**
The criminology and criminal justice program is committed to offering both a day and evening/weekend program. Evening/weekend students should watch for infrequently offered courses and take them when available. If a required course is not offered during a reasonable period, a full-time evening student may petition to substitute another course.

**CRJ 200 Intro to Criminal Justice 3 Credit Hours**
This course provides an introduction to issues of crime and neighborhood disorder as well as society’s responses to these problems. We will examine the nature and causes of crime, criminal law, constitutional safeguards, and the organization and operation of the criminal justice system including the police, courts, and corrections. The history of the criminal justice system, terminology and career opportunities will also be discussed.

**CRJ 300 Political Analysis 3 Credit Hours**
Introduction to research design, data collection and analysis, sampling, and statistics for social scientists. Should be elected as soon as possible after the declaration of major. POL 101 or equivalent recommended. (F, W).

**Restriction(s):**
Can enroll if Level is Undergraduate

**CRJ 302 Theory of the Law 3 Credit Hours**
A comprehensive introduction to the theoretical foundations and the political functions of law, with special emphasis on the different moral justifications of law; the relation between law and justice; the relation between law and freedom; due process and fairness in any legal system. This course is designed to have special relevance for those considering law as a career. POL 101 or equivalent recommended. (OC).

**Restriction(s):**
Can enroll if Level is Undergraduate

**CRJ 307 Forensic Anthropology 3 Credit Hours**
Forensic anthropology has recently seen a lot of exposure through popular television shows like CSI and Bones. Have you ever wondered how much of what you were seeing was real? Do the dead really "talk" about their lives and how they died? This course is designed as an introductory course for students interested in demystifying and getting to know the real forensic anthropology. Forensic anthropology is a specialized sub-field of biological anthropology that applies many of the methods of biological anthropology to the discovery, excavation, and identification of human remains in a medico-legal context. In this class we learn about the human skeleton and explore the key methods that are used in the identification of individuals, such as age-at-death estimation, sex determination, stature, ancestry, and personal identification. We also deal with assessment of the different types of trauma, and whether or not we can tell the cause and manner of death. The broader ethical roles and responsibilities of forensic anthropologists are also discussed, including discussions of how we determine race/ancestry, as well as ethical responsibilities we have during the investigation of human rights abuses, disasters and criminal inquiries. (F)

**Restriction(s):**
Cannot enroll if Class is Freshman

**CRJ 308 Moral and Political Dilemmas 3 Credit Hours**
This course focuses on the tensions and relations between personal morality and political action by examining the moral aspect of contemporary policy issues such as the right to life, environmental policy, and discrimination. POL 101 or equivalent recommended. (YR).

**Restriction(s):**
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

**CRJ 309 Introduction to Law & Society 3 Credit Hours**
Law and Society is a field of study that examines the interaction between the legal system and society from the perspective of the social sciences and humanities. This course focuses on core components of the legal system including courts, lawmaking bodies, regulatory administration, alternative dispute resolution systems, and the legal profession. Throughout the course, students develop the ability to examine the legal system and its relationship to equality, social change, and public benefits using social science evidence. (YR)

**Restriction(s):**
Cannot enroll if Class is Freshman
CRJ 316  **The American Judicial Process**  3 Credit Hours
An analysis of American legal institutions, processes, doctrines, and their relationship to the formulation of public policy and the solution of social problems. POL 101 or equivalent recommended. (AY).
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 322  **Psychology of Prejudice**  3 Credit Hours
A consideration of ethnic (including racial, sexual, and religious) prejudice from the psychological point of view, focusing on the mind of both the oppressor and the oppressed. (AY).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 323  **Urban Politics**  3 Credit Hours
A survey of the political process in urban areas, giving special attention to the changing roles of cities in American politics. POL 100 or equivalent recommended. (YR).
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 324  **Serial and Mass Homicide**  3 Credit Hours
The phenomenon of multiple homicide, especially mass shootings and serial murder, is of special interest in the field of criminology. Perpetrators of such acts and their methodologies can be studied for the purpose of primary and secondary prevention. (F, W)

CRJ 325  **Psych of Interpersonal Relation**  3 Credit Hours
This course presents an overview of theory and research conducted by social psychologists that has been aimed at understanding interactions between individuals. Topics include an exploration of the research process that is used to investigate interpersonal relationships, the processes underlying social perception, friendship, liking, love, close relationships, aggression and violence in interpersonal relationships. (YR).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 335  **Philosophy of Law**  3 Credit Hours
An examination of some of the important philosophical issues relevant to law and legal theory, including legal punishment, legal responsibility, and the relationship between law and morality. Both classical and contemporary writings will be studied. Prerequisite: a previous philosophy course or permission of instructor. (AY).
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 350  **Poverty and Inequality**  3 Credit Hours
In a middle class-oriented culture, the poor experience many problems and are also considered deviant, which tend to make poverty self-perpetuating. This stratum will be explored with respect to life styles, life changes, contributing factors, characteristics, individual and social consequences, and evaluation of attempted solutions. (YR).
**Prerequisite(s):** SOC 200 or SOC 201
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 362  **Women, Politics, and the Law**  3 Credit Hours
An examination of the political behavior of women in American politics. Included is an analysis of the legal and legislative demands of American women. (AY).
**Restriction(s):**
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

CRJ 363  **Crim Justice Syst and Policy**  3 Credit Hours
The structure and processes of criminal justice administration in America, including analysis of current issues in police behavior, courts, and corrections. POL 101 or equivalent recommended. (F, S, W).
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 369  **US Civil Rights Movement**  3 Credit Hours
A survey of race relations and civil rights activity from the late 19th century to the present. The principal focus, however, is on the period since World War II, especially on the mass-based Southern civil rights movement (1955-1965) and the various policy debates and initiatives of the past thirty years, most notably affirmative action and busing. We also examine critiques of non-violence and integrationism. (AY).
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 382  **Social Psychology**  3 Credit Hours
An introductory study of interrelationships of the functioning of social systems and the behavior and attitudes of individuals. (YR).
**Prerequisite(s):** PSYC 170 or PSYC 171 or SOC 200 or SOC 201 or PSYC 101
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 390  **Topics in Criminal Justice**  3 Credit Hours
Examination of problems and issues in selected areas of criminal justice. Title as listed in the Schedule of Classes will change according to content. Course may be repeated when specific topics differ. (OC)

CRJ 403  **Minority Groups**  3 Credit Hours
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. (F, W).
**Prerequisite(s):** SOC 200 or SOC 201
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 407  **Psychology of Adolescence**  3 Credit Hours
Considers adolescence as an interaction of rapid biological and social change. Examines the theoretical and empirical literature in some detail. Prerequisite or permission of instructor. (F, W).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Level is Undergraduate

CRJ 408  **Police and the Community**  3 Credit Hours
This course examines the diverse roles of the public police and how to achieve effective community policing. After reviewing the evolution of community policing, this course focuses on understanding police mission and culture, involving the community, proactive policing, implementing community policing, communicating with a diverse population, the challenge of gangs, forming partnerships with the media, and building partnerships in the community. (F, W)
**Prerequisite(s):** CRJ 200
CRJ 409  Intel and Homeland Security  3 Credit Hours
Full Title: Intelligence and Homeland Security This course will provide an in-depth examination of the principles that guide the collection, analysis, and sharing of intelligence in the United States and how these principles impact homeland security. Topics will include the US Intelligence community (CIA, FBI, military intelligence), the National Criminal Intelligence Sharing plan, the National Intelligence Strategy, and the recent emphasis placed on Intelligence-Led Policing. Emphasis will also be placed on the increased role that local and state law enforcement agencies as well as private sector entities play in contributing to the assessment of threats to homeland security. (F,W,S)
Prerequisite(s): CRJ 200

CRJ 410  Quantitative Research & Stats  4 Credit Hours
An introduction to methods of data collection and analysis. Also discussion of research design and the philosophy of social science. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 412  Men and Masculinities  3 Credit Hours
This course addresses the question, "What is a man?" in various historical, cross-cultural, and contemporary contexts. A major focus on the social and cultural factors that underlie the shape and conceptions of manhood and masculinity in America as well as in a variety of societies around the globe. (AY)
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

CRJ 413  American Constitutional Law  3 Credit Hours
A major theme of this course is the development of the constitution, especially focusing on the themes of judicial review, judicial self-restraint and judicial activism; the expansion of executive and legislative powers; and the rise of "substantive due process of law." POL 101 or equivalent recommended. (AY)
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 410  Qualitative Research Methods  3 Credit Hours
Qualitative research involves the observation and study of people in their everyday lives, in their taken-for-granted worlds. Qualitative research seeks to combine close empirical observation with analytic techniques that demand (and teach) personal and social self-consciousness as necessary to an understanding of the social world of "others". This course in qualitative methods is designed to acquaint students with field research theories and techniques. Students will gain hands-on experience in participant observation, interviewing, and the use of sociological scholarship. Qualitative Research Methods will prepare students to gather data, focus the data in a social scientific manner, analyze the data, and then organize it in reportable form. (F, W).
Prerequisite(s): SOC 308

CRJ 414  Civil Rights and Liberties  3 Credit Hours
An analysis of the Bill of Rights and the 14th Amendment, with particular emphasis upon recent landmark or controversial Supreme Court decisions dealing with freedom of speech and religion, rights of criminal defendants; cruel and unusual punishment, right to privacy; civil rights and equal protection clause; and apportionment. POL 101 or equivalent recommended. (YR).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

CRJ 415  Restorative Justice  3 Credit Hours
This course explores the practice of restorative justice as it has been engaged in historical and contemporary criminal justice contexts. Topics addressed include the principles and philosophies underlying restorative justice, differences between retributive and restorative models, victim-offender dialogue, and offender reintegration. Students will be asked to think critically about restorative and retributive systems and to apply these concepts to develop their own approach to restorative justice.
Prerequisite(s): CRJ 200
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Program is

CRJ 416  Criminal Law  3 Credit Hours
A survey of the major judicial, executive, and legislative decisions in the field of criminal law. (AY)
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 417  Crimmigration  3 Credit Hours
Full Title: Crimmigration: Intersections of Immigration and Criminal Justice This course explores the intersection(s) of the criminal justice and immigration systems with special attention to race, class, and gender. It covers the evolution of American immigration policy and its application, the criminalization of immigrants, immigrant offending and victimization, the policing of immigrant communities, and the immigrant experience in the United States.
Prerequisite(s): CRJ 200 or CRJ 468 or CRJ 473 or SOC 200 or SOC 201

CRJ 418  CJ Research Methods  4 Credit Hours
Full Title: Criminal Research Methods This course provides an introduction to methods of data collection and analysis, as well as a discussion of research design and the philosophy of social science, within the context of the field of Criminology and Criminal Justice. Attention is give to quantitative, qualitative, and mixed methodologies.
Prerequisite(s): CRJ 200 and CRJ 468
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 421  Group Processes  3 Credit Hours
Topics treated include group cohesiveness, "group think," the social structure of groups, emotional factors in group life, leadership, and development of groups. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>CRJ 423</td>
<td>American Social Classes</td>
<td>3</td>
<td>3 Credit Hours</td>
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<td>CRJ 425</td>
<td>Lab in Social Psychology</td>
<td>4</td>
<td>4 Credit Hours</td>
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<td><strong>Prerequisite(s):</strong> PSYC 381*</td>
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<td>CRJ 435</td>
<td>Urban Sociology</td>
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<td>CRJ 440</td>
<td>Abnormal Psychology</td>
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<td>CRJ 443</td>
<td>Gender Roles</td>
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<td>CRJ 445</td>
<td>Contemporary Ethical Theory</td>
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<td>CRJ 446</td>
<td>Marriage and Family Problems</td>
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<td>CRJ 447</td>
<td>Family Violence</td>
<td>3</td>
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<td>CRJ 453</td>
<td>Sociology of Law</td>
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<td>CRJ 455</td>
<td>Immigrant Cultures and Gender</td>
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<td>Can enroll if Level is Undergraduate</td>
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<tr>
<td>CRJ 460</td>
<td>Law &amp; Culture</td>
<td>3</td>
<td>3 Credit Hours</td>
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<td>CRJ 461</td>
<td>Cops &amp; Cons: Women in Prison</td>
<td>3</td>
<td>3 Credit Hours</td>
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<td><strong>Prerequisite(s):</strong> SOC 200 or SOC 201 or WST 275 or CRJ 240 or CRJ 300 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303</td>
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CRJ 465  Deviant Behavior/Soc Disorganz  3 Credit Hours
General analysis of the concepts of social deviance and social disorganization: factors producing each condition, the effects of social control measures on the course of deviance and disorganization, consequences for the social system, and the relationship between the two concepts. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 466  Drugs, Alcohol, and Society  3 Credit Hours
Analyses of the sociology of substance use and abuse. Provides a sociological framework for understanding issues and evaluating our nation’s responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American society. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 467  Drugs, Crime, and Justice  3 Credit Hours
Provides a comprehensive analysis of the current state of research on interactions between crime and drug abuse. Examines drug distribution, organization of drug systems, and mechanisms of social control of drug systems. Analyzes the social problems associated with drugs and crime. The course also focuses on drug-law enforcement and public policy strategies for dealing with drugs and crime. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 468  Criminology  3 Credit Hours
Analysis of criminal behavior in relationship to the institutional framework of society. Emphasis upon the more routinized and persistent forms of criminality along with the joint roles played by victims, the criminal, the police, and all other relevant parties. (F,W)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

CRJ 469  Juvenile Delinquency  3 Credit Hours
The analysis of juvenile delinquent behavior in relationship to the institutional framework of society. Emphasis on the extent, causes, and methods of juvenile delinquency in the United States. (YR)
Prerequisite(s): SOC 200 or SOC 201

CRJ 470  Current Issues in Crim Justice  3 Credit Hours
Current issues in the field of criminal justice and law enforcement in the U.S. and other countries. Topics include an evaluation of police activities, problems of apprehensions and prosecution, the courts and the correctional system, and the efficacy of the legal structure in its social context. (F,W,S).
Prerequisite(s): CRJ 200

CRJ 471  Int’l Criminal Justice Systems  3 Credit Hours
Description, analysis, and evaluation of selected criminal justice systems throughout the world. Course focuses on the various systems, theories, structures, methods and functions, including common law systems and socialist law systems. (YR).
Prerequisite(s): CRJ 200

CRJ 472  Correctional Systems  3 Credit Hours
Analysis of the legal, social, and political issues affecting contemporary correctional theory and practice. Topics covered include the history of corrections; the nature of existing institutions; the functions and social structure of correctional institutions; and alternatives to institutional incarceration, probation, and parole. (F, S, W).
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

CRJ 473  Race, Crime and Justice  3 Credit Hours
This course is an analysis of race and its relation to crime in the criminal justice system. Students will analyze and interpret the perceived connection between race and crime, while exploring the dynamics of race, crime, and justice in the United States. This course is designed to familiarize students with current research and theories of racial discrimination within America’s criminal justice system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman

CRJ 474  Cyber Crimes  3 Credit Hours
This course in a hands-on approach investigating cyber crimes (e.g. child exploitation, predators, sexual/vice crimes, identity theft, etc.). Students will explore and discuss legal cases involving cyber technology and predatory practices and review applicable evidentiary rules. Students will also analyze the practical and ethical considerations that apply to undercover internet operations, and evidence collection and use to locate and apprehend offenders.

CRJ 475  Digital Evidence  3 Credit Hours
This course is a detailed approach to how computers and networks function, how they can be involved in virtually any type of crime, and how they can be used as a source of evidence. Students will analyze relevant legal issues and specific investigative and forensic processes related to technology. This course examines how deductive criminal profiling, a systemic approach to focusing an investigation and understanding criminal motivations, is utilized to locate and apprehend offenders.

CRJ 476  Inside Out Prison Exchange  4 Credit Hours
This community-based course, taught in a local correctional facility, brings university students and incarcerated students together to study as peers. Together students explore issues of crime and justice, drawing on one another to create a deeper understanding of how these issues affect our lives as individuals and as a society. The course creates a dynamic partnership between UMD and a correctional facility to allow students to question approaches to issues of crime and justice in order to build a safer and more just society for all. The course encourages outside (UMD) students to contextualize and to think deeply about what they have learned about crime and criminals and to help them pursue the work of creating a restorative criminal justice system; it challenges inside students to place their life experiences into larger social contexts and to rekindle their intellectual self-confidence and interest in further education.
Restriction(s):
Can enroll if Class is Junior or Senior
CRJ 478  Criminal Justice Internship  3 to 6 Credit Hours
Provides field experience in social welfare or crinial justice agencies, e.g., for children/adolescents, in residential programs, in abuse remediation, in probation, for chemical dependencies, in victim advocacy, for the elderly, in prisons, for special needs populations, in court services, in medical/public health, in police services, and for families and communities. Supervision by approved field instructors. An internshp of 80 hours is required for three (3) credits. Instructor and student will work together to determine appropriate intern placement. Approval of instructor. (FW).
Prerequisite(s): CRJ 200

CRJ 479  Women's Studies Internship  3 Credit Hours
Provides field experience in social welfare agencies, e.g., for children/adolescents, abuse, chemical dependencies, the elderly, special needs populations, criminal justice/probation, medical/public health, and families and communities. Supervision by approved field instructors. Focus is on analysis of the social context of agency, the clients, and staff. An internship of 80 hours is required for three (3) credits. Prerequisite: WGST 275 and permission of the Women's Studies Director is required. (F, W).
Prerequisite(s): WST 275

CRJ 480  Criminal Justice Theory  3 Credit Hours
Criminal Justice theorists study of formal and informal mechanisms of social control in specific places, such as bars and night clubs, city parks, schools and shopping malls. Students in this course will learn to apply their theories to practical, real life situations to achieve behavioral changes among individuals and groups toward the objective of effective crime control.
Restriction(s):
Cannot enroll if Major is

CRJ 481  Terrorism & US Natl Security  3 Credit Hours
The United States responded to the events of September 11, 2001 with a series of unprecedented action under the umbrella of homeland security and the 9War on Terror.? This course examines American National security policy by asking a few key questions: What is terrorism and how does it threaten the United States? How has the United States responded to the threat of terrorism over time? What have the consequences of US policy been to date? Finally, how would we balance a desire for security with our desire for civil liberties and ethical action?
Prerequisite(s): CRJ 468

CRJ 482  Legal Ethics  3 Credit Hours
This course will explore the many ethical dilemmas faced by professionals in the legal system. We will pay particular attention to the criminal justice system and to the Rules of Professional Conduct for attorneys. Some of the questions we may address are: How should an attorney consider his/her own ethical beliefs when deciding the appropriate course of action in a case? How should a judge consider his/her own ethical beliefs when making a juvenile justice decision? How should a police officer determine the ethical course of action when the law's instructions are ambiguous?
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

CRJ 483  Justice, Crime and Environment  3 Credit Hours
This service-learning course focuses on environmental justice and law. Environmental Justice is defined as the fair treatment of all people with respect to the development, implementation, and enforcement of environmental laws. In the classroom, students learn the theory, history, and enforcement of environmental laws and regulations in Detroit, Michigan, and nationwide. In a required civic engagement project, students apply their substantive knowledge to solve local environmental problems. Through classroom learning and projects with community organizations, students connect law and justice concerns to Detroit's right to a clean environment.
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 484  White Collar Crime  3 Credit Hours
This course reviews the history, categories, and problems related to white-collar crime. The course covers these topics by incorporating both legal and empirical perspectives in the study of white collar crime. In this course, we will focus on the substantive and procedural white collar crime laws ('law on the books') and analyze real white collar crime cases. Simultaneously, we will pay special attention to the dynamic relationship between white collar crime and the American regulatory framework. As a result, we will assess the relationship and differences between various types of white collar crime and the regulatory regimes that oversee the business sector ('law in action'). (OC)

CRJ 485  Psychology Internship  3 or 6 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, geriatrics, human resources/staff development, mental retardation, probation departments, teenage runaways, substance abuse, and women's issues. The program is designed for juniors and seniors with a concentration in psychology or behavioral sciences and involves training in listening and helping skills. Written permission of instructor required. (FW).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior

CRJ 486  Criminalistics: CSI to Justice  3 Credit Hours
This course is a hands-on approach to learning about crime scene investigation. The course takes the student from the first response on the crime scene to documenting crime scene evidence and preparing evidence for courtroom presentation. It includes topics such as arson, homicide, suicide, and felony murder. CRJ 486 examines how the police conduct successful investigations, how the associated crime scene evidence is collected, and how to use the evidence to locate, apprehend, and prosecute the suspect.
Prerequisite(s): CRJ 200
This is the academic part of the internship. Students must meet with CRJ 494 Pol Sci Internship Seminar 3 or 6 Credit Hours. Can enroll if Level is Undergraduate. Can enroll if Class is Junior or Senior. Restriction(s): of the course. Course may be repeated when specific topics differ. Title as listed in Schedule of Classes will change according to the content. Examination of problems and issues in selected areas of criminal justice. CRJ 490 Topics in Criminal Justice 3 Credit Hours. This course will incorporate both legal and empirical perspectives to emphasize the dynamic relationship between law, crime, and society. In this course, we will focus on the substantive and procedural criminal law ('law on the books') while we simultaneously focus on empirical research of enforcement, case processing and sentencing in the criminal justice system (the 'law in action'). As a result, we will assess the relationship and differences between what the criminal law says 'on the books' and the criminal justice system in 'action'. Restriction(s): Can enroll if Class is Freshman or Sophomore or Junior or Senior. CRJ 497 Washington, D.C. Internship 3 to 6 Credit Hours. Field study placements in national, state, local government or private agencies. Primarily for junior or senior political science concentrators or other qualified applicants. Maximum of 20 students selected each term. Students must also register for CRJ 494. Only six hours of internship is allowed toward concentration requirement. (F,W,S). CRJ 498 Directed Studies 1 to 6 Credit Hours. Directed individual study of any subject agreed upon by the student and the instructor. May not duplicate a formal course offering. Restriction(s): Can enroll if Class is Junior or Senior. Can enroll if Level is Undergraduate. Economics is the study of how people choose to use resources. Economics includes the study of labor, land, and investments, of money, income, and production, and of taxes and government expenditures. Economists seek to measure well-being, to learn how well-being may increase over time, and to evaluate the well-being of the rich and the poor. Economics is a social science that studies choices and decisions at the individual, business and national levels. It offers explanations and solutions to issues and concerns such as inflation, unemployment, crime, poverty and the environment. An economics degree provides versatility and critical thinking skills for practical problem solving, which is an excellent preparation for the workplace of the future. Economics Honors Designation To be recognized as graduating with honors in economics, students must (1) complete all the requirements for the Bachelor of Arts in Economics at UM-Dearborn; (2) earn a B+ or higher in each of at least two capstone 4000-level economics courses; (3) complete an Honors research paper as part of a 3 credit hour Directed Research (ECON 499); and (4) graduate with an overall 3.25 GPA at UM-Dearborn and a 3.5 GPA in upper level economics courses. Students are expected to apply for candidate status for the Honors Award during or before the first term of their senior year at UM-Dearborn. Requirements for candidate status include being an Economics major; having a cumulative 3.25 GPA at UM-Dearborn, having successfully completed at least one core theory course (ECON 301/ECON 302/ECDN 305), and earning a 3.5 GPA average in upper level Economic classes. Dearborn Discovery Core Requirement The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-
Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

Ancient Greek I and II MCL 105 and MCL 106
Arabic I and II ARBC 101 and ARBC 102
Armenian I and II MCL 111 and MCL 112
Chinese I and II CHIN 101 and CHIN 102
French I and II FREN 101 and FREN 102
German I and II GER 101 and GER 102
Latin I and II LAT 101 and LAT 102
Spanish I and II SPAN 101 and SPAN 102

Prerequisites to the Major

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 104</td>
<td>College Algebra 1</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

1 MATH 113 or MATH 115 can be substituted but cannot also be used in the Cognate area.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 301</td>
<td>Intermediate Macroeconomics 1,2,3</td>
<td>3</td>
</tr>
<tr>
<td>ECON 302</td>
<td>Intermediate Microeconomics 1,2,3</td>
<td>3</td>
</tr>
<tr>
<td>ECON 305</td>
<td>Economic Statistics 1,2,3</td>
<td>3</td>
</tr>
<tr>
<td>Select 4 additional upper level ECON courses (excluding ECON 499) 4</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Economics Capstone

Select one course from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 4011</td>
<td>Monetary Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 4015</td>
<td>Introduction to Econometrics</td>
<td></td>
</tr>
<tr>
<td>ECON 4021</td>
<td>Economics of the Labor Sector</td>
<td></td>
</tr>
<tr>
<td>ECON 4065</td>
<td>History of Economic Thought</td>
<td></td>
</tr>
<tr>
<td>ECON 4085</td>
<td>Public Finance</td>
<td></td>
</tr>
</tbody>
</table>

Cognates

Students must complete at least six credit hours in cognate courses selected from the following list.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td></td>
</tr>
<tr>
<td>ACC 299</td>
<td>Managerial Accounting</td>
<td></td>
</tr>
<tr>
<td>ISM 120</td>
<td>Bus Prob Solving w/ Comp Apps</td>
<td></td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td></td>
</tr>
<tr>
<td>MATH 113</td>
<td>Calc I for Biology &amp; Life Sci</td>
<td></td>
</tr>
<tr>
<td>or MATH 114</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>or MATH 115</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>CCM/CIS 150/1501</td>
<td>Computer Science I</td>
<td></td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td></td>
</tr>
<tr>
<td>PHIL 234</td>
<td>Symbolic Logic</td>
<td></td>
</tr>
<tr>
<td>or PHIL 350</td>
<td>Symbolic Logic</td>
<td></td>
</tr>
<tr>
<td>PHIL/STS 485</td>
<td>Philosophy of Science</td>
<td></td>
</tr>
<tr>
<td>Any upper level courses in ANTH, GEOG, HIST, POL, SOC, URS (excluding internships and independent studies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 30

1 MATH 104, MATH 105, MATH 113, MATH 115, or equivalent are prerequisites to these courses.
2 ECON 301 and ECON 302 should be taken no later than the junior year.
3 Only one of the three courses may be transferred to UM-D
Only 3 credits of economics internship (ECON 398), can be applied to the major requirement.

Note: Students considering graduate study in economics are advised to take one year of calculus (MATH 113 & MATH 114 or MATH 115 & MATH 116), MATH 217 Introduction to Matrix Algebra, ECON 4015 Introduction to Econometrics and ECON 4065 History of Economic Theory.

Notes:

1. At least 15 of the 24 upper level credit hours of Economics (ECON) must be elected at UM-D.

**Minor or Integrative Studies Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level (300- and 400/4000-level courses) courses in Economics (ECON).

**ECON 100 Personal Economics & Finance 3 Credit Hours**

Students in ECON 100 will acquire the knowledge and tools needed to survive and thrive in the economic realities of the 21st century. Students will become familiar with the Michigan and U.S. economies, and will learn how to apply basic economic concepts to common personal choices, for example how to finance their education. They will also learn how to use economic concepts to critically evaluate economic information presented to them by others.

**ECON 2001 Introductory Economics 3 Credit Hours**

Introduction to economic reasoning, basic economic concepts and theories used in microeconomics and macroeconomics. Economic techniques including graphing and marginal analysis will also be introduced and applied to practical problems in everyday life. In addition, this course will focus on the way economic concepts can be taught at the elementary and high school level in a way that integrates economics into a broader understanding of Michigan history, government and geography. (F).

**ECON 201 Prin: Macroeconomics 3 Credit Hours**

Together with ECON 202, this course serves to introduce the student to the basic ideas and concepts of modern economic analysis, and applies them to current economic problems, policies and issues. The focus of this course is on macroeconomics: income and wealth, employment, and prices at the national level in the United States economy. It is recommended that students take ECON 201 before ECON 202. MATH 105 is highly recommended but not required. (F,W,S).

**ECON 202 Prin: Microeconomics 3 Credit Hours**

Together with ECON 201, this course serves to introduce the student to the basic ideas and concepts of modern economic analysis, and applies them to current economic problems, policies, and issues. The focus of this course is on microeconomics, the behavior of consumers and firms and their interactions in specific markets. It is recommended that students take ECON 201 before ECON 202. MATH 104 or 105 is highly recommended but not required. (F,W,S).

**ECON 290 Topics in Economics 3 Credit Hours**

Examination of problems and issues in selected areas of economics. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

**ECON 301 Intermediate Macroeconomics 3 Credit Hours**

A systematic study of the determinants of national output, economic growth, inflation, and unemployment. The effects of monetary policy, fiscal policy and other economic factors are analyzed for both the long run and short run. Debates about various approaches to macroeconomics policy are also discussed. (F,W).

**Prerequisite(s):** ECON 201 and ECON 202 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 113)

**ECON 302 Intermediate Microeconomics 3 Credit Hours**

A systematic study of the role of prices in organizing economic activity. The tools necessary for such study will be developed and applied to the analysis of the household, the firm, and the market under varying degrees of competition and monopoly. (F,W).

**Prerequisite(s):** ECON 201 and ECON 202 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 113)

**ECON 305 Economic Statistics 3 Credit Hours**

Introduction to the logic and use of statistical analysis, with emphasis on statistical inference. Topics covered include descriptive statistics, probability, estimation, hypothesis testing, and the use of linear regression analysis to study relationships between two variables. (F,W).

**Prerequisite(s):** ECON 201 and ECON 202 and (MATH 104 or MATH 105 or Mathematics Placement with a score of 113)

**ECON 311 Money and Banking 3 Credit Hours**

The structure, workings, and regulation of financial systems, concentrating on bank-like financial institutions. While financial instruments like stocks, bonds, and some derivatives are discussed, the focus is on the economic theory behind financial markets. That is, the study of monetary policy underscores the interaction between the financial system and the economy. (F,W).

**Prerequisite(s):** ECON 201

**ECON 321 Labor in the American Economy 3 Credit Hours**

An analysis of the nature and underlying causes of the problems facing the worker in modern economic society. Includes an examination of wages, unemployment, economic insecurity, the trade union movement, collective bargaining, and labor legislation. (F,W).

**Prerequisite(s):** ECON 201 and ECON 202

**ECON 325 Economics of Pov and Discrm 3 Credit Hours**

An analysis of the economic aspects of poverty and discrimination. Emphasis on the theoretical economic causes of poverty and the economic bases for discriminatory behavior, the impact of poverty and discrimination on individuals and society, and the effect of reform policies on the two problems. (AY).

**Prerequisite(s):** ECON 201 and ECON 202

**ECON 331 Industrial Organization 3 Credit Hours**

Theory and empirical evidence on the causes and effects of market power, especially in industrial markets. The focus is on the relationships between market structure and performance, and policy formation. (YR).

**Prerequisite(s):** ECON 202
ECON 335  Experimental Economics    3 Credit Hours
This course on experimental economics is devoted to laboratory experiments on individual behavior in markets as well as in social situations. It focuses on different forms of strategic interactions between agents, including competition, coordination, bargaining, and public choice. We will consider individual decision experiments, choice anomalies, and the role of information in learning and signaling. We will also discuss the design of various economic experiments, such as market bargaining, auctions, trust, gift giving, adverse selection, public goods, common pool resources, etc. Students are recommended (but not required) to take Econ 302 before enrolling in this class. Basic knowledge of Excel is required for this class.
Prerequisite(s): ECON 202 or ECON 2001
Restriction(s):
Cannot enroll if Class is Freshman

ECON 351  Environmental Economics    3 Credit Hours
Course examines the economic aspects of pollution problems. Topics covered in this course include the economic theory of externals, the theory of public goods, and the optimum use of depletable natural resources. The role of cost-benefit analysis as a part of the decision-making process is also examined. (AY).
Prerequisite(s): ECON 202

ECON 355  Health Economics    3 Credit Hours
Course examines the health of a population and the health care industry, using the tools of economic analysis. Topics include the demand and supply of health services, alternate ways of financing health care, the application of cost-benefit analysis to health projects, and comparative health economic systems (e.g., Britain, Sweden). (AY).
Prerequisite(s): ECON 202

ECON 361  U S Economic History    3 Credit Hours
A survey of the processes of development of the United States economy, their social implications, and the sources of today's economic problems. (YR).
Prerequisite(s): ECON 201 and ECON 202

ECON 362  Eur and Intl Economic Hist    3 Credit Hours
A survey of the processes of industrialization in the major non-American industrial economies, with a focus on their relevance and implications. (AY).
Prerequisite(s): ECON 201 and ECON 202

ECON 372  Economic Demography    3 Credit Hours
Course offers an introduction to economic demography, focusing on the interrelation between economic and population variables, and the techniques of demographic analysis. (OC).
Prerequisite(s): ECON 201 and ECON 202

ECON 375  Heterodox Economics    3 Credit Hours
This course introduces students to alternative perspectives on economic theory and method. These alternatives include: Marxian and radical political economics, institutional and evolutionary economics, behavioral economics, post-Keynesian economics and feminist economics. (OC).
Prerequisite(s): ECON 201 or ECON 202 or ECON 2001

ECON 385  Public Choice    3 Credit Hours
Public policy decision making, particularly governmental decisions regarding economic policies. Emphasis is on the use of economic methodology to analyze resource allocation via the political system rather than through private markets. (OC).
Prerequisite(s): ECON 201 and ECON 202

ECON 390  Topics in Economics    1 to 3 Credit Hours
Examination of problems and issues in selected areas of economics. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

ECON 390H  Topics in Economics    3 Credit Hours
Topic: The Economics of Religion, Crime, and Marriage. This course uses the tools of economics, particularly microeconomics, to explain key characteristics of religion, criminal behavior, and marriage. For religion, the course will explore church organization, church architecture, beliefs about the afterlife, doctrine about jury, and religious market structure, among others. For crime, the course will evaluate claims about the death penalty, gun control and the demand for crime. For marriage, the course will analyze multiple, marriage payments, family organization, and marriage for love, among others.
Prerequisite(s): ECON 202

ECON 390M  Topics in Economics    3 Credit Hours
Topic Title: Comparative Institutions: Cuba, the US and More. This course will analyze different institutions. This will range from colonialism to the mafia to prison gangs to economic development. A significant part of the class will be a spring break trip to Cuba. Before we go we will study the institutional literature on democracies and dictatorships and then spend a week traveling around one of the last communist countries that still exists.

ECON 398  Economics Internship    3 to 6 Credit Hours
This internship affords the student the opportunity to apply tools learned in economics courses to real-world work situations. The student has 8-16 hours of unpaid work per week under the guidance of a faculty advisor and complementary academic work supervised by an economics professor. Only three credit hours may be applied to meeting the concentration requirements in economics; up to six credit hours may be applied toward graduation credit. The internship is offered only on the S/ E grading basis. Students cannot receive credit for both ECON398 and ECON498. (F,W,S). 3.000 TO 6.000 Credit hours

ECON 4011  Monetary Economics    3 Credit Hours
This course examines financial institutions in a macroeconomic theoretical context. A rigorous treatment of monetary theory is presented followed by practical discussion of U.S. monetary policy as implemented by the Federal Reserve System. Students cannot receive credit for both ECON 4011 and ECON 411.
Prerequisite(s): ECON 311 and ECON 301
Restriction(s):
Can enroll if Level is Undergraduate

ECON 4015  Introduction to Econometrics    3 Credit Hours
The theory and practice of the statistical analysis of economic relationships. Topics covered include the construction and estimation of econometric models and tests of economic theories, emphasizing the use of multiple linear regression. Students cannot receive credit for both ECON 4015 and ECON 415.
Prerequisite(s): MATH 113 or MATH 115 and ECON 305
Restriction(s):
Can enroll if Level is Undergraduate
ECON 4021 Economics of the Labor Sector 3 Credit Hours
Theoretical analysis and empirical studies of the nature and operation of labor markets. Includes theories of wage determination and income distribution, the nature of unemployment, the impact of collective bargaining on the economy, the extent and economic effects of discrimination, and the nature and effects of government wage and employment policies. ECON 321, Labor in the American Economy, is valuable background to this course although it is not a prerequisite. This course counts as a required capstone (4000-level) course in Economics and also counts toward the Economics Honors designation. Students cannot receive credit for both ECON421 and ECON4021.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Level is Undergraduate

ECON 4065 History of Economic Thought 3 Credit Hours
Course examines the evolution of economic thought and theory from the early origins to the present, focusing on the major contributions to economics, especially from Adam Smith onward, and assesses the current condition of economic analysis. Students cannot receive credit for both ECON 465 and ECON 4065.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Level is Undergraduate

ECON 407 Cost-Benefit Analysis 3 Credit Hours
Cost-benefit analysis arguably is the most important tool in evaluating public and private policies. Conceptually, cost-benefit analysis is simple: subtract the costs from the benefits and adopt those policies yielding the greatest net benefit. In practice cost-benefit analysis is much more complicated. Costs and benefits must be summed over time, requiring a calculation of net present value. Costs and benefits must be summed over different people, requiring a social welfare function. Finally costs and benefits must be summed over a variety of goods and services, some of which do not have market values or where market values are not appropriate measures. This course reviews the techniques involved in cost-benefit analysis and employs case studies to illustrate these techniques. (AY)
Prerequisite(s): ECON 202 and ECON 302
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

ECON 4085 Public Finance 3 Credit Hours
Analysis of the role of government in the economy. Course examines theories of the need for and nature of government intervention in economic activities. Includes analysis of public goods, externalities, taxation, state, and local finance, and models of public decision making. Students cannot receive credit for both ECON 4085 and ECON 481.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Level is Undergraduate

ECON 433 Antitrust and Regulation 3 Credit Hours
This course uses economic theory to examine major antitrust laws and to evaluate government regulation of industry. ECON 331, Industrial Organization, is valuable background to this course although it is not a prerequisite. Students cannot receive credit for both ECON433 and ECON333. (OC).
Prerequisite(s): ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 437 Behavioral Public Policy 3 Credit Hours
This course teaches you to apply the insights from behavioral economics and psychology to public policy design. Empirically-based behavioral science offers policy makers the opportunity to decrease the impact of psychological limitations of lazy or boundedly rational individuals. In this course we consider various public policies that are informed by behavioral science research in the areas of retirement savings, household borrowing, health care, energy use and choice of nutrition. Graduate version of the course requires completion of additional assignments.
Prerequisite(s): ECON 201 and ECON 202 or PPOL 500
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

ECON 438 Beh Econ for Business & Policy 3 Credit Hours
This course is a reading intensive seminar on behavioral economics, which is the combination of psychology and economics that investigates what happens in markets in which some agents display human limitations and complications. The course focuses on the behavioral economics theory and its' application to business practice and policy decision making. Specifically, in this course we: (1) examine the ways in which people deviate from the standard economics models, including irrationality, preferences for fairness, propensity to cooperate, trust, dual-interest, empathy and emotions; (2) explore behavioral economics theories and models; (3) discuss how the behavioral economics theories and models can be applied to solve business and policy problems. Graduate version of this course requires completion of additional assignments. Students cannot receive credit for ECON 336 and ECON 438 or ECON 538. (FWAY)
Prerequisite(s): ECON 202 or ECON 2001
Restriction(s):
Cannot enroll if Class is Freshman

ECON 442 Economic Development 3 Credit Hours
A survey of economic problems currently affecting third world countries and the various policy options available to them. Topics covered will include agrarian vs. industrial growth, and monetary and fiscal policies, planning problems, foreign exchange and debt problems. Students cannot receive credit for both ECON 442 and ECON 342 (OC).
Prerequisite(s): ECON 201 or ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 444 Economies of the Middle East 3 Credit Hours
Survey of socio-economic issues of the post-WWII Middle East, using textbooks and web-based readings. Topics include population growth, urbanization, migration, gender issues, land reform, privatization, and stabilization policies. The Arab-Israeli conflict is not a focus of study. Grade based on papers and exams. Students cannot receive credit for both ECON 344 and ECON 444.
Prerequisite(s): ECON 201 or ECON 202
Restriction(s):
Can enroll if Level is Undergraduate

ECON 447 International Finance 3 Credit Hours
This course studies the large-scale economic issues in interdependent economies, such as the behavior of exchange rates, interest rates, income, wealth, prices, and the balance of payments. International finance focuses particularly on economic policies in a world with a multitude of currencies and increasingly integrated goods, financial, and capital markets. Students cannot receive credit for both ECON 447 and ECON 347.
Prerequisite(s): ECON 201
Restriction(s):
Can enroll if Level is Undergraduate
**ECON 448  International Trade  3 Credit Hours**
Course analyzes in depth the debate of free trade vs. protectionism. Different theoretical models of the "gains from trade" are presented, as well as studies of their empirical validity. Some historical perspective is included, as well as discussion of the current situation of the European Union. Students cannot receive credit for both Econ 348 and Econ 448.

**Prerequisite(s):** ECON 201 and ECON 202

**Restriction(s):** Can enroll if Level is Undergraduate

**ECON 482  Regional Economics  3 Credit Hours**
Course explores methods of economics evaluation of regions in terms of intra- and inter-regional activity. Regions may smaller than a nation, be a collection of nations, or be composed of portions of more than one nation. Theoretical topics include the theories of (1) the location of the firm, (2) spatial demand, (3) agglomeration economies, and (4) input-output analysis. Regional development policy is discussed using Michigan and Ontario as subjects. Students cannot receive credit for both ECON 382 and ECON 482.

**Prerequisite(s):** ECON 201 or ECON 202 or ECON 2001

**Restriction(s):** Can enroll if Level is Undergraduate

**ECON 483  Urban Economics  3 Credit Hours**
The economics of the city and the introduction of space in economic analysis; the determination of land use patterns, the location of firms and industries, and an urban area's growth; economic analysis and policy issues concerning urban poverty, housing, transportation, the local public sector, and other urban problems. Students cannot receive credit for both ECON 483 and ECON 381.

**Prerequisite(s):** (ECON 201 and ECON 202) or ECON 2001

**Restriction(s):** Can enroll if Level is Undergraduate

**ECON 497  Economics Seminar  3 Credit Hours**
An advanced study in selected areas of Economics. Topics vary; see the current Schedule of Classes for topics and prerequisites. May be offered in satisfaction of 400-level elective requirement for concentration. (OC).

**Restriction(s):** Can enroll if Level is Undergraduate

**ECON 499  Directed Research  1 to 3 Credit Hours**
Independent study under the direction of a faculty supervisor in advanced topic areas. Normally must be elected on the "pass/fail" option, in which case it does not count toward credit hour requirement for concentration. Special consideration for the A through E grading option must be approved by members of the Economics discipline. In all cases students must have faculty supervisor's permission to register.

**Restriction(s):** Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

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**English**

A major in English at the University of Michigan-Dearborn focuses on the dynamic intersection of language, literature, and society as well as the identities and communities shaped by this intersection.

English majors have the opportunity to explore the relationships between reading and writing printed text by becoming familiar with the strategies that writers use to shape conceptions of truth. The English faculty's primary goal is to help students develop a sensitivity to the ways spoken and printed language frame how we conceive and discuss our identities throughout history, in the context of a global community both in — and beyond — Metropolitan Detroit. English majors may expect to develop a close relationship to the social ramifications of the written word and its potential for incorporating both communities and individuals into a larger, more internationally aware reading and listening audience.

The UM-Dearborn English faculty offer courses that contextualize language in terms of the various traditions and genres of British and American literature, and of world literature in English, and that provide the critical skills necessary to craft effective expository and creative prose.

The English faculty are both committed, innovative teachers and active scholars, and include recipients of the campus’s awards for Distinguished Teaching and Distinguished Research. Faculty frequently direct students in independent study projects, and often teach courses that connect literature to other fields, from history and the arts to religion, philosophy, science, and visual culture.

**Humanities Internship Program**

The Humanities Internship Program offers practical experience to students concentrating in English and other humanistic fields and those interested in communication or journalism. Students gain and demonstrate skills desired by employers, make important contacts, and explore a field of work before graduation. For more information on the Humanities Internship, see the Internship Coordinator, 3028 CB, 313-583-6376, or inquire at the Literature, Philosophy, and The Arts Department office in 3011 CB, 313-593-5433.

**Independent Study**

Independent Study (ENGL 399) provides an opportunity for students to extend the work of existing courses or to explore areas not included in the current course offerings. Consult the Literature, Philosophy, and the Arts Department Guidelines for Independent Study, available in the Department Office, 3011 CB, 313-593-5433. To enroll in an independent research project, students must have a prior, written Independent Study Contract with the instructor and prior; written permission of the Department Chair. One to three credit hours available.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.
Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
  • Lecture/Lab Science Course
  • Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

 Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient Greek I and II</td>
<td>MCL 105 and MCL 106</td>
</tr>
<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
</tr>
<tr>
<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
</tr>
<tr>
<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
</tr>
<tr>
<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
</tr>
<tr>
<td>German I and II</td>
<td>GER 101 and GER 102</td>
</tr>
<tr>
<td>Latin I and II</td>
<td>LAT 101 and LAT 102</td>
</tr>
<tr>
<td>Spanish I and II</td>
<td>SPAN 101 and SPAN 102</td>
</tr>
</tbody>
</table>

Prerequisites to the Major
Students are required to complete the following as a prerequisite:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 200</td>
<td>Intro to English Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

This course serves as the “gateway” to the major with enrollment limited to 20 students per section. ENGL 200 exposes students to the terms of English Studies, literary criticism and literary theory, knowledge essential to higher-level English courses.

Virtually all upper-level English courses require as prerequisites ENGL 200 and COMP 106 or equivalent. In addition, other prerequisites for a specific upper-level English course may be introduced by the instructor in the term in which the course is offered. Students are advised to consult the current Schedule of Classes for prerequisites each term. If a student has not satisfied the prerequisites of a course, the student may be enrolled by permission of the instructor, provided that there are other relevant qualifications.

Major Requirements
All students majoring in English must complete 30 credit hours of upper-level ENGL.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 311</td>
<td>British Lit: Beowulf to Milton</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 312</td>
<td>British Lit: Milton to 1900</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 313</td>
<td>American Lit: Colonial to 1900</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 314</td>
<td>Brit &amp; Amer Lit: 1900-Present</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/WGST 471</td>
<td>LGBTQ Literature</td>
<td>3</td>
</tr>
</tbody>
</table>

All of the following survey courses are required: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL/AAAS 238</td>
<td>Intro to Lit: Arab American (ENGL 238 will not count in the 30 upper level credits required for the major.)</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/AAAS 239</td>
<td>Intro to Lit: African American (ENGL 239 will not count in the 30 upper level credits required for the major.)</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/AAST 238</td>
<td>Black Men in America</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 443</td>
<td>Anglo-Irish Literature</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/WGST 445</td>
<td>20C/21C Women Authors</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/AAAS 469</td>
<td>Contemporary African Amer Lit</td>
<td>3</td>
</tr>
</tbody>
</table>

1 Students are encouraged to take these surveys early in their careers so that they acquire an overview of literary history before taking more specialized upper-level courses. Students are required to take all four, but they can be taken at any time after ENGL 200 and are not prerequisites for other courses.

The English Diversity Requirement (CAED): English majors must elect one course with substantial inclusion of literature in English that expands the traditional Anglo-American literary curriculum. This literature may represent various national groups, ethnic groups, genders, and subcultures. The following courses satisfy the English "Diversity Requirement":

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL/AAST 238</td>
<td>Intro to Lit: Arab American (ENGL 238 will not count in the 30 upper level credits required for the major.)</td>
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</tr>
<tr>
<td>ENGL/AAAS 239</td>
<td>Intro to Lit: African American (ENGL 239 will not count in the 30 upper level credits required for the major.)</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/AAST 238</td>
<td>Black Men in America</td>
<td>3</td>
</tr>
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</tr>
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<td>3</td>
</tr>
<tr>
<td>ENGL/AAAS 469</td>
<td>Contemporary African Amer Lit</td>
<td>3</td>
</tr>
</tbody>
</table>
The courses which address literature prior to 1800. Choose from:

The Schedule of Classes for any particular semester.

Courses that satisfy the English Diversity Requirement will be noted in the Schedule of Classes for any particular semester.

The English Historical Requirement (CAEH): English majors must elect one course which addresses literature prior to 1800. Choose from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL/HUM/RELS 349</td>
<td>Arab American Women Writers</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 4705/AAAS 470/HUM 4705/WGST 470</td>
<td>Black Women / Lit, Film, Music</td>
<td>3</td>
</tr>
</tbody>
</table>

Or other options that may be available on a semester by semester basis.

Courses that satisfy the English Diversity Requirement will be noted in the Schedule of Classes for any particular semester.

The English Historical Requirement (CAEH): English majors must elect one course which addresses literature prior to 1800. Choose from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL/HUM 358</td>
<td>Shakespeare on Film</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 372</td>
<td>Eng Lit: 1500 to 1600</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 373</td>
<td>English Lit 1600-1660</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 374</td>
<td>Restoration and Early Eighteenth-Century Literature</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 375</td>
<td>The Age of Johnson and Burney</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 408</td>
<td>Shakespeare I: Earlier Works</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 409</td>
<td>Shakespeare II: Later Works</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 410</td>
<td>Maj Engl Authors of the Renais</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 413</td>
<td>Shakespeare’s Contemporaries</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 420</td>
<td>Maj Engl 18th-Century Authors</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 423</td>
<td>Restoration Drama</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 424</td>
<td>18th-Century English Novel</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 427</td>
<td>Jane Austen</td>
<td>3</td>
</tr>
</tbody>
</table>

The English Research Intensive Requirement (CAER): English majors must elect one course designated “Research Intensive,” from the following list:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 408</td>
<td>Shakespeare I: Earlier Works</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 409</td>
<td>Shakespeare II: Later Works</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 410</td>
<td>Maj Engl Authors of the Renais</td>
<td>2-3</td>
</tr>
<tr>
<td>ENGL 413</td>
<td>Shakespeare’s Contemporaries</td>
<td>2-3</td>
</tr>
<tr>
<td>ENGL 420</td>
<td>Maj Engl 18th-Century Authors</td>
<td>2-3</td>
</tr>
<tr>
<td>ENGL 423</td>
<td>Restoration Drama</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 424</td>
<td>18th-Century English Novel</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 427</td>
<td>Jane Austen</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 434</td>
<td>The Victorian Novel</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 440</td>
<td>Major 20C/21C Engl/Amer Auths</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 443</td>
<td>Anglo-Irish Literature</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 450</td>
<td>Maj Am Auth to the Civil War</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 453</td>
<td>Contemporary American Novel</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 455</td>
<td>Stud in 19th-Cent Amer Lit</td>
<td>3</td>
</tr>
</tbody>
</table>

Or an "Independent Studies in English" (ENGL 399)

Cognates

English majors must also complete at least six credit hours of cognate courses which are to be selected from upper-level offerings in art history (ARTH), comparative literature (COML), communication (COMM), history (HIST) (excluding HIST 3085), humanities (HUM) (excluding HUM 485), journalism and screen studies (JASS), linguistics (LING), music history (MHIS) or philosophy (PHIL). Other courses that can be shown to be specifically complementary to the study of literature are sometimes approved by Petition as cognates. Cross listed comparative literature, communication, journalism and screen studies, linguistics, and humanities courses may be elected either for major or for cognate credit, but not for both.

Notes:

1. A maximum of 54 hrs. in ENGL may count in the 120 hrs. required for graduation.
2. At least 15 of the 30 upper level credit hours in English (ENGL) must be elected at UM-D.

Secondary Certification Supplement

One of the following supplements is required for students seeking certification for high school teaching in English. A major consists of 30 hours, including one upper-level writing course (ENGL 323 or ENGL 327) and two linguistics courses (LING 280 or LING 281 and ENGL 461/ENGL 461). The balance of the thirty hours for the major must be selected with the approval of the degree and certification advisors in accordance with the English major and certification requirements.

A minor in English for certification consists of 20 hours, including the same required courses in writing and linguistics, with the balance to be selected with the approval of degree and certification advisors. See secondary certification (https://umd.arborn.edu/cehrs/undergraduate-programs/areas-study/undergraduate-degree-programs/secondary-grades-6-12-certification/) for more information.

Both the major and the minor have as a supplementary requirement, not included in the 30 or 20 hours, LIBR 470 Literature for Young People.

Minor or Integrative Studies

Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in English (ENGL).

ENGL 200 Intro to English Studies 3 Credit Hours
An introduction to English Studies for English concentrators. The course provides students with the interpretive, analytical and basic research skills, the critical vocabulary, the understanding of genre, and the knowledge of major critical approaches necessary for the study of literature. Readings will consist primarily of poetry, fiction, drama, and non-fiction prose written in English by British and American authors, but the course will also include other historical and cultural texts as well as works of criticism. Students will submit at least 20 pages of written work for extensive instructor feedback. (F,W)

Prerequisite(s): COMP 105 or COMP 110 or Composition Placement Score with a score of 30
ENGL 230  Introduction to Literature  3 Credit Hours
Introduces students to imaginative literature in several genres, including, for example, fiction, poetry, and drama. Stress will be both on appreciation of the aesthetic and cultural value of reading literature and on understanding the process of reading sensitively and intelligently.

ENGL 231  Intro to Literature: Poetry  3 Credit Hours
A disciplined introduction to the reading of poetry, English and American. (F,W).

ENGL 232  Intro to Literature: Fiction  3 Credit Hours
A disciplined introduction to the reading of short stories and novels, English and American. (F,W).

ENGL 233  Intro to Literature: Drama  3 Credit Hours
A disciplined introduction to the reading of plays, English and American. (F,W).

ENGL 238  Intro to Lit: Arab American  3 Credit Hours
This course in an introduction to Arab American literature, its historical and cultural contexts and contemporary relevance. Topics will include the literary and cultural productions of Arab immigrants, their transnational vision, and explorations of such concepts as home, memory and identity; the literary, dramatic and poetic responses of Arab American writers to 9/11 and the ongoing war on terror; the role Arab American literature in offering different versions of Arab and Arab American lives and experiences from the one circulated in mainstream media, Hollywood cinema and culture.

Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 239  Intro to Lit: African American  3 Credit Hours
A study of African-American literature designed to expose students to important periods, works, and authors within historical context. Topics will include slavery, reconstruction, the Great Migration, the Harlem Renaissance, and the contemporary renaissance in Black women's literature. Students will be required to read, critically discuss, analyze, and write their responses to several literary genres that will be incorporated (fiction, drama, poetry).

ENGL 301  Literary Criticism  3 Credit Hours
This course introduces literary criticism and theory from Aristotle to the present, focusing on the changing concept of literature's nature and function. Lectures, readings, and discussion cover such critics as Aristotle, Dryden, Pope, Johnson, Wordsworth, Coleridge, Arnold, T.E. Hulme, I.A. Richards, T.S. Eliot, and such movements as New Criticism, Phenomenology, Reader-Response, Archetypal Criticism, Structuralist-Semiotic Criticism, Psychological approaches to literature, New Historicism, Marxism, Feminism, and Deconstruction.

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 304  Studies in Detroit Culture  3 Credit Hours
This course is an attempt to define a modern cultural history of Detroit. Taught by two faculty members, the emphasis of the course will vary but the following aspects of the city's cultural history will be covered in some detail: its literature, arts, music, and architecture; its social conditions and broader American culture context. (AY).

ENGL 306  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic, and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience.

Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270

Restriction(s):
Can enroll if Level is Undergraduate

ENGL 310  Narrative Journalism  3 Credit Hours
Students learn to identify, understand and use the techniques of fiction in the service of nonfiction material. While studying the texts as literature, students are also encouraged to view them as models for writing. Assignments include the writing and revising of articles, based on research and interviews, and written in story form, drawing on literary techniques. (YR).

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 311  British Lit: Beowulf to Milton  3 Credit Hours
A study of British literature from the Anglo-Saxon period to the works of John Milton, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR)

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 312  British Lit: Milton to 1900  3 Credit Hours
A study of British literature from the works of John Milton to 1900, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR)

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 313  American Lit: Colonial to 1900  3 Credit Hours
A study of American literature from the Colonial period to 1900, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR)

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 314  Brit & Amer Lit: 1900-Present  3 Credit Hours
A study of British and American literature from 1900 to the present, designed to introduce students to important authors, works, and literary movements in their wider historical and cultural contexts. (YR)

Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
ENGL 322 SiD--Writing in Detroit 3 Credit Hours
Full Title: Semester in Detroit: Writing on Detroit--Beyond the Other. This course serves as an elective course for the Semester in Detroit (SiD) program. It is devoted to short fiction in search of a creative rendering of the people in Detroit, a city which offers rich opportunities to explore the theme of the "other". Students will develop short narratives that capture their impressions of the city through its people. Each student will find Detroiters to "study" and creatively report on. Class discussions will help direct students. (S)
Prerequisite(s): ENGL 223 or COMP 223

ENGL 327 Advanced Exposition 3 Credit Hours
A study of rhetorical theory and its application to various types of expository essays. Writing assignments will reflect the types of essays studied. May be repeated to a maximum of six credit hours. (OC).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 331 Online Reprtng,Resrch,Writing 3 Credit Hours
Course introduces the technical, social, legal and ethical practice of online research, focusing on research skills required by journalists and other writers. Students use new media technology to generate ideas, to research subjects, and to develop general-audience writing projects in their areas of interest. Course covers the use of Web search engines, directories and databases; finding sources and interviewing people online; evaluating the credibility of online sources and information; using Lexis-Nexis to access archives and public records; and using spreadsheet and database programs.
Prerequisite(s): COMP 106 or COMP 110 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40

ENGL 341 Religion and Literature 3 Credit Hours
An investigation of the ways in which religious ideas and practices have informed works of literature, and vice versa. Surveying a variety of genres and themes, the course will focus mainly on British and/or American literature and its engagement with Judeo-Christian religion, though some attention may be devoted to other literary and religious traditions (e.g., ancient and medieval texts, European and world literature, Islam and Eastern religions).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 343 Adaptations of Literary Texts 3 Credit Hours
This course explores the adaptation of literary texts in a variety of literary genres (poetry, drama, fiction) to other artistic mediums (film, graphic novels/comics, paintings, etc.). Moving beyond limited comparisons of "good" originals and "bad" adaptations, this course focuses on the dialogue among multiple versions of the same story across a range of historical periods, asking how and why adaptations modify their sources in a particular manner. This course addresses the difference between adaptation and appropriation as well as imitation, quotation, allusion, pastiche, and parody.
Prerequisite(s): (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239) and (COMP 106 or COMP 220 or COMP 270 or COMP 280)
Restriction(s):
Cannot enroll if Class is Freshman

ENGL 349 The Bible In/As Literature 3 Credit Hours
This course will study selected readings from the Bible, first in regard to their own literary, historical, and cultural contents, and then in regard to their reception, interpretation, and reapplication by later literary tradition. Biblical selections may cover both the Old and New Testaments as well as Apocryphal traditions, while readings from later non-biblical texts will be drawn from various literary periods.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 356 Reading Urban Monstrosity 3 Credit Hours
This course questions the literary techniques and forms the English writers developed between 1660 and 1900 to characterize and imagine London to be a unified community and to counter the growing perception of London as a "monstrous city." This image of "the English-speaking City" as an uncontrollable monster may be explored in writings by Daniel Defoe, Jane Austen, Elizabeth Gaskell, Robert Louis Stevenson, Charles Dickens, Thomas Hardy, and Joseph Conrad.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 358 Shakespeare on Film 3 Credit Hours
The course examines the adaption of Shakespeare's play-scripts for the screen. It goes beyond a discussion of the relative merits of plays and their respective film adaptions, examining the complex exchanges between the two artistic mediums (e.g. how stage convention such as soliloquies or off-stage action are adapted to the screen; how early silent films were used to market stage productions, etc.). It will approach the issue of adaption by examining the works of key directors, multiple films of a single play, silent films, foreign languane adaptions, mass market and art house films, and films which deal with fictive or actual productions of Shakespeare's plays. Special emphasis will be placed on specific stage productions that are later adapted to films. In this course, students will explore a broad range of responses to and interpretations of Shakespeare's works. This class will stress the idea that each staging is an interpretation of the play, its point of view conditioned by the times, the medium, and the director's vision. (OC)
Restriction(s):
Can enroll if Level is Undergraduate

ENGL 368 20C/21C British/Amer Poetry 3 Credit Hours
A survey of 20th- and 21st-century British and/or American poetry and poets, including such authors as Wallace Stevens, W.H. Auden, T.S. Eliot, Dylan Thomas, Langston Hughes, and Sylvia Plath.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 370 Narratives of Film and Lit 3 Credit Hours
Explores the narrative conventions of literary and filmic fictions in a cultural, historical, and psychoanalytic context. Goes beyond a discussion of the relative merits of novels and their respective film adaptations and examines the more complex interchanges between the two narrative forms, the ideological function of narrative in contemporary society, and the effect of the medium of a fictional text on the reader/viewer. (AY).
Prerequisite(s): HUM 248 or ENGL 248 or FILM 248 or JASS 248
ENGL 372  Eng Lit: 1500 to 1600  2 to 3 Credit Hours
A survey of English literature from the beginnings of the Renaissance in England through the works of Sidney, Spenser, and Shakespeare (excluding his plays).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 373  English Lit 1600-1660  3 Credit Hours
A survey of English literature from Jonson, Bacon, and Donne through the Metaphysicals, the Cavaliers, and Milton's early poems. Representative prose works will also be studied.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 374  Restoration and Early Eighteenth-Century Literature  3 Credit Hours
A survey of English literature of the Restoration and early 18th century, with special emphasis on verse satire (Swift, Montague, and Pope), Restoration drama (Behn, Wycherly, and Congreve), and the origins of the English novel (Defoe, Fielding, and Richardson). (OC)
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250)

ENGL 375  The Age of Johnson and Burney  3 Credit Hours
A survey of English Literature of the late 18th century. Readings address the literary gothic, Boswell's journals, the "graveyard school" of poetry, Samuel Johnson's poetry and prose, the 1789 revolutionary fervor, and the novels of Frances Burney and Jane Austen.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250)

ENGL 376  Brit Lit in Romantic Era  2 to 3 Credit Hours
A survey of British literature from 1789 to 1832 with special emphasis on the rise of Romantic poetry.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 377  Victorian Poetry and Prose  2 to 3 Credit Hours
A survey of British poetry and prose during the reign of Queen Victoria 1837 to 1901.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 378  Victorian Poetry and Prose  2 to 3 Credit Hours
A survey of British poetry and prose during the reign of Queen Victoria 1837 to 1901.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 379  The Odyssey of Blk Men in Amer  3 Credit Hours
This course will examine the struggle of African American men for personal, political, and creative expression. This course incorporates several literary genres (narrative, fiction, essay, drama, and poetry) and the literary voices of black men who range from professional writers to politicians, from athletes to actors. Students will be required to critically read, discuss, analyze, and write their own responses to the literature found in the texts.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 380  Topics in English  3 Credit Hours
Examination of problems and issues in selected areas of English. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC)
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 381  Intro to Postcolonial Studies  3 Credit Hours
This course offers a general introduction to Postcolonial Studies - a field of cultural inquiry that questions how personal identity (specifically race, language and ethnicity) shapes, and is shaped by, the politics of colonization and nationalism. Students will clarify the subject of Postcolonial Studies by examining a variety of cultural and linguistic objects (literature, film, TV-journalism, slave- and middle-passage-narrative, and political manifesto) from a variety of cultural perspectives (Arab American, Anglo-Indian, West African, and Caribbean).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250

ENGL 382  Gender Issues in Literature  3 Credit Hours
A study of gender issues in English and American literature. The exact topic will vary from semester to semester, but the course may feature such topics as gay and lesbian literature, feminist criticism, images of masculinity, the representation of sexual ideologies, etc. Course may be repeated for credit when specific topic differs.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 383  Postcolonial Studies  3 Credit Hours
This course offers a general introduction to Postcolonial Studies - a field of cultural inquiry that questions how personal identity (specifically race, language and ethnicity) shapes, and is shaped by, the politics of colonization and nationalism. Students will clarify the subject of Postcolonial Studies by examining a variety of cultural and linguistic objects (literature, film, TV-journalism, slave- and middle-passage-narrative, and political manifesto) from a variety of cultural perspectives (Arab American, Anglo-Indian, West African, and Caribbean).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250

ENGL 384  Independent Studies in English  1 to 3 Credit Hours
Readings or analytical assignments in English, selected in accordance with the needs and interests of those enrolled and agreed upon by the instructor and the student. May be repeated for a maximum of 6 credit hours. (F,W).
ENGL 408  Shakespeare I: Earlier Works  3 Credit Hours
Intensive study of selected works from the first half of Shakespeare's career, designed to increase the student's critical appreciation and understanding. Students cannot receive credit for both ENGL 408 and ENGL 509.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 409  Shakespeare II: Later Works  3 Credit Hours
Intensive study of selected works from the second half of Shakespeare's career, designed to increase the student's critical appreciation and understanding. Students cannot receive credit for both ENGL 409 and ENGL 509.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 410  Maj Engl Authors of the Renais  2 to 3 Credit Hours
An investigation of significant themes and attitudes current in the Renaissance, as seen through an intensive examination of the works of two or three major authors, such as More, Spenser, Bacon, and Donne.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 413  Shakespeare's Contemporaries  2 to 3 Credit Hours
An examination of the performance and cultural contexts of plays by English Renaissance playwrights (Marlowe, Middleton, Webster, Jonson, etc.), working around the time of Shakespeare. A limited number of Shakespeare's plays may be included.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Level is Undergraduate

ENGL 420  Maj Engl 18th-Century Authors  2 to 3 Credit Hours
An intensive study of two or three authors, such as Dryden, Behn, Pope, Swift, Burney, Austen, or Samuel Johnson. Students cannot receive credit for both ENGL 420 and ENGL 520.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 421  Swingers, Flirts, & Libertines  3 Credit Hours
An examination of the functions that writers in English have assigned to literary decadence, libertinism, and aestheticism (or, the study of beauty and “art for art’s sake”). We will read writers who identified themselves as libertines as well as writers who represented libertines as we address the Restoration rake (Rochester & Behn), the Regency buck (the Shelleys & DeQuincey), the Victorian dandy (Oscar Wilde, Michael Field, & the Decadents), the modern playboy (Nin, Waugh & Fitzgerald), hippie-swinger (Wolfe & Jagger), and finally, the postmodern player-celebrity (Bret Easton Ellis, Will Self & rock-lyricists).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 422  Satire  3 Credit Hours
An exploration of satirical writing and its functions from its English origins in eighteenth-century London (Montagu, Swift, Pope) to its twenty-first-century reincarnations in both America and Britain (Zadie Smith, Burgess, Schulyer, Hughes, Waugh). The course emphasizes the various goals that writers have assigned to satire, especially in terms of race, gender, and nationalism.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239

ENGL 423  Restoration Drama  3 Credit Hours
A survey of playwriting and theatrical performance in England from Charles II's opening of the theaters in 1660 to the Licensing Act of 1737. Playwrights and movements include historical drama (Dryden, Rowe), tragicomedy (Southerne), urban social satire (Behn, Etherege, Gay, Centlivre, and Congreve), subversive comedy (Behn and Wycherley), sentimental comedy (Steele), and revisions of Shakespeare.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 424  18th-Century English Novel  3 Credit Hours
A study of the rise and development of the English novel during the 18th century. Consideration is given to such novelists as Defoe, Richardson, Fielding, Sterne, Austen, and Smollett. Students cannot receive credit for both ENGL 424 and ENGL 524.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
ENGL 427 Jane Austen 3 Credit Hours
This course reads all six (6) of Jane Austen's major novels to 1) contextualize Austen's continued popularity within current debates about sexuality and marriage; and 2) study how the narrative arc of a female novelist's career responds to--and helps readers process--the revolutionary upheavals between late eighteenth- and early nineteenth-century Britain. Readings include _Northanger Abbey_, _Sense & Sensibility_, _Pride & Prejudice_, _Mansfield Park_, _Emma_, and _Persuasion_, and may also include Austen's juvenalia, unfinished work, and fiction by her precursors. (OC) 
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 430 Stud in 19th-Century Brit Lit 3 Credit Hours
Intensive study of a special topic in 19th-century British literature. The course may treat a single author (e.g., Dickens), a movement (e.g., the Pre-Raphaelites), or a theme (e.g., literary responses to the French Revolution, the literature of mental crisis, Victorian social criticism). 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 434 The Victorian Novel 3 Credit Hours
A study of the British novel during the reign of Queen Victoria, 1837 to 1901. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 440 Major 20C/21C Engl/Amer Auths 3 Credit Hours
An intensive study of works of representative English and American authors since 1900. Students cannot receive credit for both ENGL 440 and ENGL 540. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

Restriction(s):
Cannot enroll if Class is Graduate

ENGL 441 Major 20C/21C English Authors 3 Credit Hours
An intensive study of several modern English authors, such as Shaw, Joyce, Forster, Dylan Thomas, D.H. Lawrence, and Woolf. Students cannot receive credit for both ENGL 441 and ENGL 541. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

Restriction(s):
Cannot enroll if Class is Graduate

ENGL 442 Studies in 20-21 Century Lit 3 Credit Hours
Intensive study of a special topic in 20th- or 21st-century literature in English. The course may treat a single author (e.g. E.M. Forster), a movement (e.g. Postmodernism), a genre (e.g. modern short story), or a theme (e.g. Literature of World War). 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

Restriction(s):
Can enroll if Level is Undergraduate

ENGL 443 Anglo-Irish Literature 3 Credit Hours
A survey of Irish literature written in English. Special emphasis will be given to Swift, Lady Gregory, Synge, Yeats, Joyce, and O?Casey, whose works will be examined in the context of Ireland’s unique history and culture. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 444 Sem in 20C/21C Poetry 3 Credit Hours
A seminar focusing on the poems of two or three English and/or American poets of the 20th- or 21st-century. Intensive discussion of individual poems, along with lectures on authors’ critical and historical backgrounds. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 445 20C/21C Women Authors 3 Credit Hours
An analysis of selected works by significant and emerging 20th and 21st century women authors writing in English, with special emphasis on issues of gender and social and cultural identity. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

Restriction(s):
Cannot enroll if Class is Graduate

ENGL 450 Maj Am Auth to the Civ War 3 Credit Hours
An intensive study of two or three authors, such as Charles Brockton Brown, Nathaniel Hawthorne, or Harriet Beecher Stowe, from the earlier periods of American Literature. Students cannot receive credit for both ENGL 450 and ENGL 550. 
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 and COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

Restriction(s):
Cannot enroll if Class is Graduate
ENGL 451  Maj Am Auth Civ War to WWI  3 Credit Hours
An intensive study of two or three major authors from the period between the Civil War and World War I, such as Emily Dickinson, Charles Chesnutt, or Henry James. Students cannot receive credit for both ENGL 451 and ENGL 551.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 452  Major 20C/21C American Authors  3 Credit Hours
An intensive study of several modern American authors, from the World War I to the present, such as Langston Hughes, Frost, Hemingway, and Faulkner. Students cannot receive credit for both ENGL 452 and ENGL 552.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 453  Contemporary American Novel  3 Credit Hours
Study of selected American novels and novelists since WWII with an eye to their social, political, and literary contexts. Course will focus on major works by major authors and representative works by lesser-known writers in order to explore technical, thematic and critical crosscurrents among the works. Students cannot receive credit for both ENGL 453 and ENGL 553.
Prerequisite(s): (COMP 106 or COMP 220 or Composition Placement Score with a score of 40 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 454  Postmodern Literature  3 Credit Hours
This course explores the expression of postmodernism in literature (primarily fiction) and critical theory. Selected works of fiction and creative non-fiction will be analyzed in terms of the problems and issues raised by the postmodern movement. Students cannot receive credit for both ENGL 454 and ENGL 554.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 455  Stud in 19th-Cent Amer Lit  3 Credit Hours
Close investigation of a special topic in 19th century American literature. The course may treat a single author (e.g. Whitman), a movement (e.g. transcendentalism), or a theme (e.g. utopianism, technology, or pragmatism), and may draw on work from other field of study.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

ENGL 456  Modern English Grammar  3 Credit Hours
The morphological and syntactic analysis of the structure of present day English considered in the light of modern linguistic science. Students cannot receive credit for both ENGL 461 and ENGL 561.
Prerequisite(s): LING 280 or LING 281 or LING 480
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 467  Script-Writing Workshop  3 Credit Hours
This writing intensive course will train students to compose a film script, focusing on the substance, structure, and style of an original screenplay. The course will be conducted as a workshop in which students will first study classic scripts (and films based on these) of the film-school generation of directors, then model scenes and sequences of their own scripts on the principles of the above texts, and finally, write their own respective film stories in accordance with an appropriate narrative structure and design. (YR).
Prerequisite(s): JASS 310 or COMP 310 or ENGL 310 or COMM 310

ENGL 468  Writing Young Adult Fiction  3 Credit Hours
In this course participants will explore the young adult novel from the point-of-view of a reader and a writer. They will read recently published and critically acclaimed popular young adult novels. They will use these texts to explore such issues as gender, race and identity as they relate to young adult lives and their respective cultures generally. They will use these texts as models for the production of their own texts and will consider the constraints and benefits of constructing and writing to a particular audience. They will consider if and why young adult novels are abbreviated or limited in relationship to adult literature. In addition to reading about ten novels, they will complete several creative exercises leading up to a final portfolio. Students will not receive credit for both ENGL 468 and ENGL 568.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 223 or COMP 223)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 469  Contemporary African Amer Lit  3 Credit Hours
An intensive study of major 20th-century African-American writers. Fiction, poetry, autobiography, and drama will be examined but one genre will be stressed in any given term, e.g., the novel. Lectures will provide historical and biographical context for analysis and discussion of the works. Students cannot receive credit for both ENGL 469 and ENGL 569.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 223 or COMP 223)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 470  Studio in Film Script-Writing  3 Credit Hours
This writing intensive course will train students to compose a film script, focusing on the substance, structure, and style of an original screenplay. The course will be conducted as a workshop in which students will first study classic scripts (and films based on these) of the film-school generation of directors, then model scenes and sequences of their own scripts on the principles of the above texts, and finally, write their own respective film stories in accordance with an appropriate narrative structure and design. (YR).
Prerequisite(s): JASS 310 or COMP 310 or ENGL 310 or COMM 310
ENGL 4705  Black Women / Lit, Film, Music  3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender and class have shaped the creative work of Black women. Students will be required to read, discuss, analyze and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash, and singer Billie Holliday.
Prerequisite(s): FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303

ENGL 471  LGBTQ Literature  3 Credit Hours
This course surveys primarily contemporary literature by writers who identify as gay, lesbian, bi-sexual, transgender, or queer. By studying the self-representation and culturally unique perspective of this emerging canon of writers, students in this course understand the emergence of LGBTQ literary traditions and understand the cultural diversity within these traditions. Students learn to identify the aesthetic qualities (such as camp, performativity, coded subtexts, homoeroticism, and the relationship between creativity and sexuality), and historical, political, and social concerns that characterize LGBTQ literary and cultural production. Topics covered include the struggle for civil rights before and after Stonewall, coming out narratives, the negotiation of homophobic cultures, post-colonial writers, and memoirs of the LGBTQ experience, as well as the historical emergence of sexual categories and the literary critique of heteronormativity. This course counts toward the English discipline diversity requirement. Students cannot receive credit for ENGL 471 and ENGL/WGST 571.
Prerequisite(s): (ENGL 200 or ENGL 231 or ENGL 230 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 237 or ENGL 238 or ENGL 239) and (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (YR)

ENGL 472  Reading in Multicult Contexts  3 Credit Hours
An examination of the effect of different cultural backgrounds on reading and literature. Topics include contrastive rhetoric, folk narrative, and multicultural juvenile literature. This course does not satisfy requirements for the English concentration. Not open to English concentrators. Students cannot receive credit for both ENGL 472 and ENGL 572. (YR)
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Cannot enroll if Class is Graduate

ENGL 473  Arab American Women Writers  3 Credit Hours
Examines the literary and cultural contributions of Arab and Arab American women novelists, poets and artists to the development and consolidation of the cultures of understanding and coexistence; explores the tensions between citizenship and belonging, race and the politics of fears, gender and geographical mobility, and ethnic minorities and mainstream consciousness; discerns how Arab women writers and artists retool their various artistic endeavors to channel socio-political disenchantment, critique and civil disobedience; stresses how literary and artistic productions of a heterogeneous number of Arab American women writers and artists can indeed foster alternative visions of socio-cultural coexistence, dialogue and hospitality via artistic commitments to technical and stylistic experimentation and renovation. Students cannot receive credit for both ENGL 473 and ENGL 573. For graduate credit take ENGL 573.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 238 or ENGL 239

ENGL 482  History of the English Language  3 Credit Hours
A thorough grounding in the history and structure of the English language. At issue are the linguistic and ideological origins of the concept of Standard English, and the strengths and limitations of different methods of analyzing the history of the language. The course will emphasize sound change, grammatical change, and their sociological context. (YR)
Prerequisite(s): LING 280 or LING 480
Restriction(s):
Can enroll if Level is Undergraduate

ENGL 486  Queer Theory & Literature  3 Credit Hours
This course reads theories of sexuality to analyze how writers since 1600 have imagined printed text to reflect and shape desire, particularly same-sex desire. The course questions how same-sex desire appears in literature written before the theorization of “the Homosexual” in the late nineteenth century as well as how writers imagine sexuality before a hetero/homosexual binary appears. Writers may include contemporary theorists (Sedgwick, Foucault, Butler) as well as novelists (Gaskell and Stoker), playwrights (Kushner and Wycherley), and poets.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or AAAS 239)

ENGL 487  Monsters, Women & the Gothic  3 Credit Hours
This course questions our inheritance of “the gothic” as a district literary style that continues to discipline readers’ notions of gender and sexual identity. The course argues that by tracing the gothic’s literary history, we may simultaneously witness a history of gender formation. Readings may include English novelists who originated a gothic style in English (Walpole, Radcliffe, Lewis) as well as English and American poets and novelists who have debated as well as resisted the effects of the gothic on readers’ (particularly women’s) psychology (Christina Rossetti, Austen, King, Stoker).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
ENGL 488 Env Lit & Reps of Nature 3 Credit Hours
An interdisciplinary study of the ways in which the relationship between "nature" and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th centuries, but assigned materials may include readings from other cultures and historical periods.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENGL 490 Advanced Topics in English 3 Credit Hours
Examination of advanced problems and issues in selected areas of English studies. Title as listed in the Schedule of Classes will change according to content. May be repeated for credit when specific topics differ.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Environmental Science
The Bachelor of Science in Environmental Science provides students with a strong background in areas of science related to environmental concerns and with an opportunity to study environmental problems from a scientific point of view that integrates biology, chemistry, Earth science, and physics. The major leads to a Bachelor of Science degree and prepares students for careers in waste management, environmental consultation, teaching, environmental health and resource management.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

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<th>Code</th>
<th>Title</th>
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<td>Ancient Greek I and II</td>
<td>MCL 105 and MCL 106</td>
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<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
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<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
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<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
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<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
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<td>German I and II</td>
<td>GER 101 and GER 102</td>
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<td>Latin I and II</td>
<td>LAT 101 and LAT 102</td>
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<td>Spanish I and II</td>
<td>SPAN 101 and SPAN 102</td>
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Prerequisites to the Major

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
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<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
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<td>CHEM 144</td>
<td>Gen Chemistry IB</td>
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<tr>
<td>GEOG 203</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>MATH 113</td>
<td>Calc I for Biology &amp; Life Sci</td>
<td>4</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 114</td>
<td>Calc II for Biology &amp; Life Sci</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>PHYS 100</td>
<td>Perspectives in Physics</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>1</td>
</tr>
</tbody>
</table>
PHYS 150 General Physics I

Total Credit Hours 30-31

1 Students in the Environmental Chemistry concentration must elect PHYS 125 or PHYS 150.

### Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Environmental Science Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 344</td>
<td>Quantitative Analysis</td>
<td>4</td>
</tr>
<tr>
<td>ENST/STS 301</td>
<td>Concepts of Environmentalism</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 301</td>
<td>Environmental Science 1</td>
<td>4</td>
</tr>
<tr>
<td>ESCI/Biol 304</td>
<td>Ecology</td>
<td>4</td>
</tr>
<tr>
<td>ESCI/ENST 395</td>
<td>Sem on Environmental Issues</td>
<td>1</td>
</tr>
</tbody>
</table>

Select at least three upper-level credit hours in Geology (GEOL) 2

Select at least three upper-level credit hours in Environmental Science (ESCI) 2

#### Research/Internship/Capstone

Select 3 credit hours from the following:

- At least three credit hours in ESCI 498 and/or ESCI 499 culminating in a public seminar presentation of research results
- ENST 385 Environmental Internship
- & ENST 485 and Seminar in Environ Topics
- ESCI 492 Capstone Research Experience

Total Credit Hours 25

1 Credit cannot be earned for both ESCI 275 and ESCI 301. ESCI 275 cannot be used in the environmental science major. However, when students already have credit for ESCI 275, it is possible to substitute ESCI 275 for the ESCI 301 lectures, but must complete the ESCI 301 lab. This may be accomplished with approval to take ESCI 499 (independent study, contract required) where the required work is the ESCI 301 lab. See the Environmental Science faculty advisor to discuss.

2 Beyond courses applied to other portions of the major requirements

**Note:** LIBS 395 may be substituted by Petition for ENST 385 if the cooperative education work assignment is environmentally oriented.

### Concentration (16-24 hrs)

Must select one of the following concentrations:

#### Environmental Biology Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select twelve credit hours in upper-level (300+) Biological Sciences (BIOL) courses (other than BIOL 304) including at least seven credit hours selected from:

- BIOL/ESCI 315 Aquatic Ecosystems
- BIOL/ESCI 320 Field Biology
- BIOL/ESCI 337 Plant Ecology
- BIOL 360 Population Genetics & Evolutn
- BIOL 361 Population Genetics & Evol Lab
- BIOL/ESCI 414 Limnology

#### Environmental Chemistry Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

- BIOL 140 Intro Molec & Cellular Biology
- PHYS 126 Introductory Physics II
- PHYS 151 General Physics II

All of the following courses are required:

- CHEM 225 Organic Chemistry I
- CHEM 226 Organic Chemistry II
- CHEM 227 Organic Chemistry Laboratory
- ESCI/CHEM 348 Environmental Chemistry
- ESCI/CHEM 349 Environmental Chemistry Lab

At least eight additional credit hours selected from:

- CHEM/BCHM/ Biochemistry Laboratory I
- CHEM/BCHM/ Biochemistry Laboratory II
- CHEM 470
- CHEM/BCHM/ Biochemistry II 2
- BIOL 471
- CHEM/BCHM/ Biochemistry Laboratory I
- CHEM/BCHM/ Biochemistry Laboratory II
- CHEM 473

**Note:** Acceptable by Petition when topic is environmentally oriented.

#### Earth Science Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

- BIOL 140 Intro Molec & Cellular Biology
- PHYS 126 Introductory Physics II
- PHYS 151 General Physics II
- GEOL 377 Field Methods (This course is required for the concentration.)
ESCI 304 Ecology 4 Credit Hours
Relationships between organisms and their environments. Patterns in the physical environment, physiological and behavioral adaptations, population dynamics, energy flow, nutrient cycling; succession. Three hours lecture, four hours laboratory (with field trips). (F).
Prerequisite(s): BIOL 130 and (MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 116)
Corequisite(s): ESCI 304L

ESCI 305 Intro to GIS 4 Credit Hours
An introductory course that examines the digital representation, manipulation, and analysis of geographic data, with emphasis on the analytical capabilities that GIS brings solutions to geographic problems. Students will explore and learn GIS principles using ESRI’s mapping software, as well as complete a major GIS project.
Prerequisite(s): GEG 302
Corequisite(s): ESCI 305L

ESCI 315 Aquatic Ecosystems 4 Credit Hours
An introduction to the physical, chemical, and biological characteristics of lakes, rivers, and wetlands emphasizing a comparison of ecosystem structure and function. Laboratory emphasizes data collection and analysis to characterize a representative lake, river, and wetland. Lecture and laboratory. (AY,F).
Prerequisite(s): BIOL 130 and (CHEM 124 or GEOL 118)

ESCI 320 Field Biology 4 Credit Hours
Adaptations, taxonomy, systematics, ecology, and behavior of southeastern Michigan flora and fauna. Techniques of field observation and recording are emphasized. Skills in the use of identification keys and guides are developed. The campus Environmental Study Area is used intensively. Three hours lecture, four hours laboratory (with field trips). (S).
Prerequisite(s): NSCI 120 or NSCI 233

ESCI 330 Land Use Planning and Mgmt 4 Credit Hours
Environmental aspects of land use planning, park planning, and site planning. Consideration of soils, groundwater, topography, and sensitive natural features and their role in determining land-use suitability. Examination of the mechanics and effectiveness of the planning process. Lecture and recitation. (AY,W).
Prerequisite(s): (BIOL 130 and GEOL 118) or ESCI 275

ESCI 332 Hazardous Waste Management 3 Credit Hours
Environmental problems associated with solid and hazardous waste. Regulations governing the generation, transport, and disposal of hazardous waste. Waste management techniques, including reduction, reuse, recycling, treatment, incineration, and land disposal. Three hours lecture. (AY,W).
Prerequisite(s): GEOL 118 or ESCI 275

ESCI 337 Plant Ecology 3 Credit Hours
This course focuses on different aspects of the relationship between plants and their environment. Topics include: a) interactions of plants with the physical environment; b) ways in which the environment acts to shape plant populations through evolution; c) intra- and interspecific interactions among individuals; and d) large-scale patterns and processes at the landscape-level. Three hours lecture.
Prerequisite(s): BIOL 130
ESCI 348  Environmental Chemistry  3 Credit Hours
Description of the concepts, principles, practices, and current problems in the chemistry of natural waters, the soil, and the atmosphere. Three hours lecture. (AY,W).
Prerequisite(s): CHEM 344 and (CHEM 225 or CHEM 325)

ESCI 349  Environmental Chemistry Lab  1 Credit Hour
Collection and analysis of air, water, soil, and organisms for pollutants such as noxious gases, heavy metals, and trace organics. EPA-approved methods are emphasized. Four hours laboratory. (AY,W).
Prerequisite(s): ESCI 348* or CHEM 348*

ESCI 352  Introduction to Toxicology  3 Credit Hours
An introduction to the principles of toxicology with an emphasis on environmental toxicology. Major topics include toxic agents, toxicological mechanisms, and use of toxicological reference literature. Discussion of chemical carcinogenesis, genetic toxicology, immunotoxicology, teratology, and toxic responses of the skin, eyes and nervous system. Three hours lecture. (AY,W).
Prerequisite(s): CHEM 225

ESCI 370  Environmental Geology  3 Credit Hours
Interactions between people and the physical environment. Geological hazards and natural processes, such as earthquakes, volcanism, floods, landslides, and coastal processes. Relationships between geology and environmental health, including chronic disease, water use and pollution, waste disposal, mineral resources, and energy use. Three hours lecture. (AY).
Prerequisite(s): GEOL 118

ESCI 372  Energy Resources  3 Credit Hours
Origin and development of fossil fuels (petroleum, coal, natural gas) and of radioactive ores used in nuclear power. Renewable and alternative energy sources, including hydro, solar, wind, biomass, and geothermal power. Environmental impacts of energy use. Three hours lecture. (OC).
Prerequisite(s): GEOL 118 or ESCI 275 or ESCI 301

ESCI 375  Groundwater Hydrology  4 Credit Hours
Prerequisite(s): GEOL 118

ESCI 390  Topics in Environmental Sci  1 to 3 Credit Hours
A course in special topics current to environmental science. Topics and format may vary. See current Schedule of Classes.

ESCI 395  Sem on Environmental Issues  1 Credit Hour
Readings, discussions, and presentations which examine current environmental issues. One hour seminar. Permission of instructor. (F,W).

ESCI 414  Limnology  4 Credit Hours
The study of the structural and functional relationships and productivity of organisms in lakes and streams as they are regulated by their physical, chemical and biotic environments. Laboratories will emphasize field study of area lakes and streams. Three hours lecture, four hours laboratory. BIOL/ESCI 304 or ESCI 275 recommended.
Prerequisite(s): BIOL 130 and (CHEM 136 or CHEM 146)
Corequisite(s): ESCI 414L

ESCI 416  Stream Ecology  4 Credit Hours
A study of the physical, chemical and biological characteristics of streams and rivers. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304

ESCI 420  Advanced Field Ecology  4 Credit Hours
An intense study of behavioral ecology and field-oriented research at an advanced level, utilizing ecological habitats on campus and in surrounding urban areas. Focus will be on plant/animal interactions and will include pollination ecology, reproduction and distribution ecology, optimal foraging theory, as well as hypothesis testing of animal migration and distribution of species in extreme urban environments. Three hours lecture, four hours laboratory. (OC).
Prerequisite(s): BIOL 304 or BIOL 320 or ESCI 320
Restriction(s):
Can enroll if Class is Senior

ESCI 422  Conservation Biology  3 Credit Hours
This course is a study of the historical and current preservation of global biodiversity. The value of biodiversity, extinction, threats to biodiversity, and both ex situ and in situ conservation strategies are considered. (F, AY)
Prerequisite(s): BIOL 304 or ESCI 304
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

ESCI 485  Spatial Analysis  3 Credit Hours
Full Title: Spatial Analysis and the Environment The statistical methods behind analyzing spatial datasets is covered in detail, with a strong emphasis on environmental sciences and human populations. This course complements courses in remote sensing, geographic information systems, and geographic principles and is designed to quantitatively evaluate the relationships between objects and their surroundings. (S)
Prerequisite(s): GEOL 305 or ESCI 305 or GEOL 340 or ENST 340 or GEOG 302 or GEOG 202 or GEOG 305
Restriction(s):
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

ESCI 490  Topics in Environmental Sci  1 to 3 Credit Hours
A course in special topics of current interest in environmental science. Topics and course format may vary; see current Schedule of Classes for availability. (OC)

ESCI 490A  Topics in Environmental Sci  3 Credit Hours
Topic: Conservation Biology. A scientific study of the concept of conservation biology, including its ecological, economic, ethical, and cultural components. Lectures, assigned readings, and class discussions will explore the major threats to biodiversity, the complexities of conservation issues, and the tools, strategies, and techniques conservation biologists use to implement policies for the protection and preservation of ecosystems from local to global and short-to long-term scales.
Prerequisite(s): BIOL 130
Restriction(s):
Can enroll if Class is Junior or Senior
ESCI 490B  Sustainable Cities  3 Credit Hours
Topic Title: Sustainable Cities: In 2007, for the first time in human history, the world became an urban one with more than 50 percent of its population living in cities. The unseen influx of people into cities socio-ecological challenges of increasing scale. This course is a discussion of sustainability and resilience efforts (solution-focused) in cities around the world and follows a multi-disciplinary approach by integrating urban-focused concepts from history, sociology, ecology, geography, and architecture and planning., Topics include, for example, air pollution and climate change, sprawl and smart growth, alternative energy, public transportation, waste management, water management, green architecture, environmental and social (in)justice, cultural diversity, and forestry and farming. (OC).

ESCI 492  Capstone Research Experience  3 Credit Hours
An approved research experience with a full-time Environmental Science faculty member. Research results are reported in a seminar presentation and in a poster, thesis, or a manuscript submitted for publication. (F, W, S) Restriction(s): Cannot enroll if Class is Freshman or Sophomore or Junior

ESCI 497  Seminar in Environmental Sci.  1 Credit Hour
Readings, discussion, and presentation of research in selected areas of study. One hour seminar. Permission of instructor. (OC).

ESCI 498  Indep Study in Environ Sci  1 to 3 Credit Hours
Library research and independent study performed under the guidance of a faculty member. Four to twelve hours readings. Permission of instructor. (F,W,S).

ESCI 499  Lab Research in Environ Sci  1 to 3 Credit Hours
Directed laboratory or field research performed under the guidance of a faculty member. Four to twelve hours laboratory. Permission of instructor. (F,W,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Environmental Studies

The solutions to the current environmental problems are complex and require teamwork and understanding between specialists and generalists in many disciplines. The Bachelor of Arts in Environmental Studies focuses on the interdisciplinary nature of environmental problem solving at the local, regional and international level. Students can choose from among four (4) concentrations. Throughout their academic studies, students in this program interact with students in the Environmental Science program.

Career Opportunities

Upon completion of this program, the graduates have a great variety of career opportunities available in both the public and private sector. For example, recent graduates hold such positions as teacher, national park naturalist, resource policy planner, Regional Director of International Joint Commission, Director of Environmental Programs for SEMCOG, regional land use planner, public health officer, and director of a public interest group. All students who qualify for graduate school should seriously consider working toward an advanced degree, which is required for most leadership positions.

Internship Program

An important feature of this program is the internship requirement that allows the students to examine possible professional positions in an area of their interest through on-the-job experience. Some of the internships which environmental studies students have had are field analyst for the Michigan Department of Environmental Quality, hazardous waste analyst, marine safety inspector with the U.S. Coast Guard, public health sanitarian, researcher for a public interest group, national park naturalist, assistant to a state legislator, director of a community organic garden, summer camp nature director, and assistant analyst in a remote sensing operation.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)
Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)
Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)
Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

- Ancient Greek I and II: MCL 105 and MCL 106
- Arabic I and II: ARBC 101 and ARBC 102
- Armenian I and II: MCL 111 and MCL 112
- Chinese I and II: CHIN 101 and CHIN 102
- French I and II: FREN 101 and FREN 102
- German I and II: GER 101 and GER 102
- Latin I and II: LAT 101 and LAT 102
- Spanish I and II: SPAN 101 and SPAN 102

Prerequisites to the Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>Computer Literacy/Info Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>130</td>
<td>Intro Org and Environ Biology</td>
<td>4</td>
</tr>
<tr>
<td>134</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>118</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Credit Hours: 15

1. MATH 104, MATH 105, MATH 113 or MATH 115 is a required prerequisite for CHEM 134.
2. Other computer literacy courses may substitute for CIS 112 by Petition.

Other lower-level prerequisite courses vary according to upper-level courses students elect to take. Review the list of courses in the Environmental Core Courses and the Concentration Areas to determine the proper prerequisites. Some of the prerequisites may be fulfilled through the Dearborn Discovery Core requirements.

Environmental Core Courses (27-29 hrs)

The graduate in Environmental Studies requires a broad background of knowledge in the Natural Sciences, the Humanities, the Social Sciences, and the Behavioral Sciences as well as interdisciplinary courses which provide a synthesis among disciplines. Students in the program will also have an opportunity to interact with a variety of environmental professionals through seminars and an internship.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESCI 330</td>
<td>Land Use Planning and Mgmt</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 340</td>
<td>Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>POL 445</td>
<td>Environmental Law</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives (CALR)

Select from the following (minimum 8 credits required):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 350</td>
<td>Prehistoric Archaeology</td>
<td>1</td>
</tr>
<tr>
<td>BIOL/ESCI 304</td>
<td>Ecology</td>
<td>3</td>
</tr>
<tr>
<td>ENST/GEOG 203</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>ENST/GEOG 204</td>
<td>Landforms</td>
<td>3</td>
</tr>
<tr>
<td>ENST/GEOG 310/STS 309</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
</tbody>
</table>

Major Requirements

Must select one concentration below. A minimum of 18 credit hours of courses chosen from one of the following four Concentration Areas:

Concentration A: Land Resources

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL/ESCI 320</td>
<td>Field Biology</td>
<td>4</td>
</tr>
<tr>
<td>ENST/STSI 301</td>
<td>Concepts of Environmentalism</td>
<td>3</td>
</tr>
<tr>
<td>ENST 305</td>
<td>Env Instrumentation and Analys</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 301</td>
<td>Environmental Science</td>
<td>4</td>
</tr>
<tr>
<td>ENST 385</td>
<td>Environmental Internship</td>
<td>1</td>
</tr>
<tr>
<td>ENST/ESCI 395</td>
<td>Sem on Environmental Issues</td>
<td>1</td>
</tr>
<tr>
<td>ENST 485</td>
<td>Seminar in Environ Topics</td>
<td>2</td>
</tr>
</tbody>
</table>

Choose one course from the following (CAVC):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENST/PHIL/STS 312</td>
<td>Environmental Ethics</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Credit cannot be earned for both ESCI 275 and ESCI 301. ESCI 275 cannot be used in the environmental studies major. However, when students already have credit for ESCI 275, it is possible to substitute ESCI 275 for the ESCI 301 lectures, but must complete the ESCI 301 lab. This may be accomplished with approval to take ESCI 499 (independent study, contract required) where the required work is the ESCI 301 lab. See the Environmental Studies faculty advisor to discuss.
Concentration B: Naturalist

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL/ESCI 304</td>
<td>Ecology</td>
<td>4</td>
</tr>
<tr>
<td>ENST/EDD 474</td>
<td>Environmental Education</td>
<td>3</td>
</tr>
<tr>
<td>ENST/EDD 485</td>
<td>Environmental Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>Electives (CANT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select from the following (minimum 8 credits required):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 350</td>
<td>Prehistoric Archaeology</td>
<td></td>
</tr>
<tr>
<td>ANTH 370</td>
<td>Indians of North America</td>
<td></td>
</tr>
<tr>
<td>ANTH/STS 430</td>
<td>Medical Anthropology</td>
<td></td>
</tr>
<tr>
<td>BIOL/ESCI 337</td>
<td>Plant Ecology</td>
<td></td>
</tr>
<tr>
<td>BIOL 353</td>
<td>Ornithology</td>
<td></td>
</tr>
<tr>
<td>BIOL 424</td>
<td>Biology of Spiders</td>
<td></td>
</tr>
<tr>
<td>ENST 326/325</td>
<td>Anth of Health and Environment</td>
<td></td>
</tr>
<tr>
<td>ENST/GEOL 340</td>
<td>Remote Sensing</td>
<td></td>
</tr>
<tr>
<td>ENST/ENGL/STS 488</td>
<td>Env Lit &amp; Reps of Nature</td>
<td></td>
</tr>
<tr>
<td>ESCI/GEOG/GEOL 305</td>
<td>Intro to GIS</td>
<td></td>
</tr>
<tr>
<td>ESCI/BIOL 315</td>
<td>Aquatic Ecosystems</td>
<td></td>
</tr>
<tr>
<td>GEOG/ENST 203</td>
<td>Weather and Climate</td>
<td></td>
</tr>
<tr>
<td>GEOG/ENST 204</td>
<td>Landforms</td>
<td></td>
</tr>
<tr>
<td>GEOL 350</td>
<td>Geomorphology</td>
<td></td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
<td></td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization or HRM 305</td>
<td></td>
</tr>
<tr>
<td>or HRM 305</td>
<td>Human Resource Policy/Admin</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

1 Can be taken up to three times if location is different.

Concentration C: Resources Policy and Management

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Required Courses</td>
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</tr>
<tr>
<td>ENST/POL/STS 325</td>
<td>Environmental Politics</td>
<td>3</td>
</tr>
<tr>
<td>ENST/POL 445</td>
<td>Environmental Law</td>
<td>3</td>
</tr>
<tr>
<td>ENST/ECON 351</td>
<td>Environmental Economics</td>
<td>3</td>
</tr>
<tr>
<td>or ENST 456</td>
<td>Ecological Economics</td>
<td></td>
</tr>
<tr>
<td>ESCI/BOL 304</td>
<td>Ecology</td>
<td>4</td>
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<tr>
<td>Electives (CARP)</td>
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<tr>
<td>Select from the following (minimum 5 credits required):</td>
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<tr>
<td>ECON 372</td>
<td>Economic Demography</td>
<td></td>
</tr>
<tr>
<td>ENST/GEOG 310/STS 309</td>
<td>Economic Geography</td>
<td></td>
</tr>
<tr>
<td>ENST 456</td>
<td>Ecological Economics</td>
<td></td>
</tr>
<tr>
<td>ENST/POL 467</td>
<td>Food Politics and Policy</td>
<td></td>
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<tr>
<td>ENST/CRJ 483</td>
<td>Justice, Crime and Environment</td>
<td></td>
</tr>
<tr>
<td>ENST/POL 487</td>
<td>Comparative Enviro Policy</td>
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</tr>
<tr>
<td>ESCI/GEOG/GEOL 305</td>
<td>Intro to GIS</td>
<td></td>
</tr>
<tr>
<td>ESCI/GEOG 332</td>
<td>Hazardous Waste Management</td>
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<tr>
<td>ESCI/GEOG 372</td>
<td>Energy Resources</td>
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<tr>
<td>ESCI/GEOL 305</td>
<td>Intro to GIS</td>
<td></td>
</tr>
<tr>
<td>POL 300</td>
<td>Political Analysis</td>
<td></td>
</tr>
<tr>
<td>POL 312</td>
<td>Legislative Process</td>
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<td>PADM 527</td>
<td>PR for Nonprofit/Public Sector</td>
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<tr>
<td>STAT 301</td>
<td>Biostatistics</td>
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</table>

1 Cannot receive credit for both STAT 301 and 325.

Concentration D: Urban Services

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite Courses</td>
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</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
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</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>POL 101</td>
<td>American Politics</td>
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<tr>
<td>SOC 200</td>
<td>Understanding Society</td>
<td>3</td>
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<tr>
<td>Required Courses</td>
<td></td>
<td></td>
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<tr>
<td>ECON 483</td>
<td>Urban Economics</td>
<td>3</td>
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<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
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<tr>
<td>GEOG/ENST 300/STS 308</td>
<td>Urban Geography</td>
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<tr>
<td>POL/CRJ 323</td>
<td>Urban Politics</td>
<td>3</td>
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<tr>
<td>SOC/AAAS/HUM</td>
<td>Studies in Det.Hist. &amp; Culture</td>
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<tr>
<td>HIST 304</td>
<td>Urban Sociology</td>
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<tr>
<td>or SOC 435</td>
<td>Urban Sociology</td>
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<tr>
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<tr>
<td>Select from the following (minimum 3 credits required):</td>
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</table>

Total Credit Hours

18
ENST 201 Cultural Geography 3 Credit Hours
Overview of the major components of culture such as language, religion, agriculture, settlement patterns, and related landscape features in a spatial context. Emphasis on how various cultures perceive and interact with the environment. (F).

ENST 203 Weather and Climate 3 Credit Hours
The controls and conditions of Earth’s weather and climate including atmospheric circulation, precipitation processes, severe weather, climatic regions, and climatic change. (F).

ENST 204 Landforms 3 Credit Hours
Processes and agents that shape the landscapes and landforms of the Earth’s surface. The discussion of landforms is divided into two parts: (1) constructive processes and their spatial distribution and (2) gradational processes and their spatial distribution. (W).

ENST 206 Introduction to GIS 3 Credit Hours
This course will demonstrate the interdisciplinary nature of environmental problems solving through current readings, classical monographs and films. Students will conduct a system analysis of a household and a local community. This course will not be open to students who take ENST 105. (W).

ENST 300 Urban Geography 3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges such as sprawl, pollution, congestion, crime, poverty, etc., are addressed. (W).

ENST 301 Concepts of Environmentalism 3 Credit Hours
Designed to identify the underlying concepts of any environmental issue. The course will demonstrate the interdisciplinary nature of environmental problems solving through current readings, classical monographs and films. Students will conduct a system analysis of a household and a local community. This course will not be open to students who take ENST 105. (W).

ENST 305 Env Instrumentation and Analys 3 Credit Hours
This course will survey the parameters which must be measured in order to properly assess the environment. Methods for the analysis of the biophysical as well as the social, psychological, and political environment will be studied. (W).

ENST 306 Political Analysis 3 Credit Hours
Spatial aspects of the ways people make their living. Discussion of the spatial distribution of resources and wealth at various scales. Introduction of site selection and location analysis. (W).

ENST 309 Global Climate Change 3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges such as sprawl, pollution, congestion, crime, poverty, etc., are addressed. (W).

ENST 310 Economic Geography 3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges such as sprawl, pollution, congestion, crime, poverty, etc., are addressed. (W).

ENST 312 Environmental Ethics 3 Credit Hours
The relationship of human beings to the non-human environment raises pressing moral and political issues. This course will use the theories and concepts of philosophical ethics to explore such questions as human obligations to non-human animals; the preservation of wilderness; balancing economic, aesthetic, and spiritual values; and the problems of pollution, urban sprawl, and ecological justice. (F, YR).

ENST 316 Hazardous Waste Management 3 Credit Hours
Designed to identify the underlying concepts of any environmental issue. The course will demonstrate the interdisciplinary nature of environmental problems solving through current readings, classical monographs and films. Students will conduct a system analysis of a household and a local community. This course will not be open to students who take ENST 105. (W).

ENST 320 Global Climate Change 3 Credit Hours
This course explores concepts and current thinking on global climate change and environmental impacts. It covers the history of Earth’s climate, causes of climate change and current research attempting to forecast change. The biotic, economic, and social implications of climate change are discussed. (AY)

ENST 325 Environmental Politics 3 Credit Hours
This course will examine the process of policy making on environmental and energy problems at the global level, at the national level, and at the local level. (AY).

ENST 326 Anth of Health and Environment 3 Credit Hours
Cultural conflicts over pollution, disease etiology, development and natural resources often originate and are played out in local ecosystems. Anthropologists are increasingly becoming involved as researchers, developers, and activists in these cultural strifes. This course reviews the work of environmental and medical anthropologists as well as other critical scholars who unravel the values, meanings and ideologies associated with ecological issues in given localities. Drawing on theoretical advances in critical medical anthropology, environmental anthropology and applied anthropology, the course seeks to improve the knowledge and abilities of student anthropologists in their environmental health work.
ENST 327  Michigan Geography  3 Credit Hours
A geographic study of the landforms, waterways, natural resources, landmarks and economic activities that contribute to the physical and cultural landscapes of Michigan. Population, industry, agriculture, recreation and tourism will all be considered. (W,S,YR)

ENST 330  Land Use Planning and Mgmt  4 Credit Hours
Environmental aspects of land use planning, park planning, and site planning. Consideration of soils, groundwater, topography, and sensitive natural features and their role in determining land-use suitability. Examination of the mechanics and effectiveness of the planning process. Lecture and recitation. (AY).
Prerequisite(s): ESCI 275 or (BIOL 130 and GEOL 118)

ENST 340  Remote Sensing  3 Credit Hours
This course explores the acquisition, processing, and visualization of remotely derived data, with a particular emphasis on local and environmental applications. ENST 340 covers concepts and foundations of aerial and orbital remote sensing, visual interpretation, reflectance and emission spectroscopy, active and passive sensors, topography, and digital image processing software and techniques.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ENST 351  Environmental Economics  3 Credit Hours
This course examines the economic aspects of pollution problems. Topics covered include the economic theory of externalities, the theory of the commons, the theory of public goods, and the optimum use of depletable natural resources. The role of cost-benefit analysis as an intricate part of the decision-making process will also be thoroughly examined. (AY).
Prerequisite(s): ECON 202

ENST 365  Environmental Psychology  3 Credit Hours
A survey of the contributions of the behavioral sciences to the understanding and solution of environmental problems that threaten our survival. Insights derived from psychology, anthropology, and computer sciences are discussed. Major topics include overpopulation, overconsumption, future shock, cognitive limitations in our understanding of ecological-political systems, and the use of Skinnerian behavior control. (AY).
Prerequisite(s): PSYC 170 or PSYC 171

ENST 385  Environmental Internship  1 to 9 Credit Hours
A field assignment relating to the student's environmental interests. The student will work in an off-campus government or private business for a prescribed number of hours each week to be arranged by the advisor and employer. May be repeated up to three times. Written permission of instructor.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ENST 390  Topics in Environmental Stds  1 to 9 Credit Hours
Examination of problems and issues in selected areas of environmental studies. Title listed in the Schedule of Classes will change according to the content. Course may be repeated for credit when specific topics differ.

ENST 395  Sem on Environmental Issues  1 Credit Hour
Readings, discussions, and presentations which examine current environmental issues. One hour seminar. Written permission of instructor. (YR).

ENST 436  Human Ecology  3 Credit Hours
Deals with the forms and modes of change of social structure and culture, as affected by interactions with environment, population, and technology. Emphasis is given to territorially based social structures.

ENST 445  Environmental Law  3 Credit Hours
A survey of common law theories and analysis of environmental statutes from a functional perspective. The course also includes environmental law aspects of constitutional law, administrative law and criminal law, as well as the public trust doctrine and public lands. Student cannot receive credit for both ENST 350 and ENST/POL 445.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

ENST 456  Ecological Economics  3 Credit Hours
A review of major theories and issues concerning the relationship between ecological and economic systems. Topics include these questions: What is the purpose of economics activity? How important is the preservation of the natural world compared to the production of economic goods? How do principles of social and intergenerational equity affect the use of resources and choice of goods to be produced? The course utilizes a transdisciplinary approach in the development of new models where conventional economics and ecology alone have been ineffective in addressing questions of sustainability and equity. (AY).
Prerequisite(s): (ECON 201* or ECON 202*) and ENST 301*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ENST 467  Food Politics and Policy  3 Credit Hours
How do politics affect our food at the global, national, and urban/local scale? This course examines close historical relationships between politics and food; the politics of conventional agriculture and food policy; and alternative agricultural movements and food systems, with a particular emphasis on urban food policy and urban food systems. (AY)

ENST 474  Environmental Education  2 to 3 Credit Hours
An analysis of environmental education at elementary and secondary levels, particularly stressing the environment as a teaching resource. Community resources as they relate to environmental education are also investigated. (AY).

ENST 483  Justice, Crime and Environment  3 Credit Hours
This service-learning course focuses on environmental justice and law. Environmental Justice is defined as the fair treatment of all people with respect to the development, implementation, and enforcement of environmental laws. In the classroom, students learn the theory, history, and enforcement of environmental laws and regulations in Detroit, Michigan, and nationwide. In a required civic engagement project, students apply their substantive knowledge to solve local environmental problems. Through classroom learning and projects with community organizations, students connect law and justice concerns to Detroit's environmental problems.
Restriction(s):
Can enroll if Class is Junior or Senior

ENST 485  Seminar in Environ Topics  2 Credit Hours
A seminar course taken during the student’s senior year to provide an opportunity for students with diverse environmental interests to interact and synthesize the information and skills acquired during their previous studies. (W).

ENST 486  Environmental Interpretation  2 to 3 Credit Hours
Course deals with the interpretation of the environment, its characteristics, and its presentation to school groups as well as to the general public. Intended to acquaint students with a variety of skills and techniques necessary for interpreting the environment to others. Extensive use is made of the UM-Dearborn Environmental Study Area. (AY).
ENST 487  Comparative Enviro Policy  3 Credit Hours
This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages—from defining an issue as an environmental problem to placing it on political agenda and then receiving a response at domestic governmental or international levels. This course analyzes environmental issues from a cross-cultural and comparative perspective, with a particular attention given to political institutions, political change, levels of development, political culture, public participation, and international commitments that shape the nature and dynamics of environmental politics and policy in different countries.
Restriction(s):
Can enroll if Class is Junior or Senior

ENST 488  Env Lit & Reps of Nature  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between "nature" and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th centuries, but assigned materials may include readings from other cultures and historical periods.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

ENST 490  Dir Research in Envir Studies  1 to 6 Credit Hours
This course will provide students with an opportunity to conduct an independent research investigation on topics in environmental studies under the direction of various faculty members. The results will be presented in a paper and public seminar. May be repeated.

ENST 491  Topics in Environmental St  3 Credit Hours
The examination of problems and issues in selected areas of environmental studies. The title listed in the Schedule of Classes will change according to the content. The course may be repeated for credit when the specific topic differs. Also offered for graduate credit. (OC).

ENST 491B  Topics in Environmentl Studies  3 Credit Hours
TOPIC: Comparative Environmental Policy. This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages—from defining an issue as an environmental problem to placing it on political agendas and then receiving a response at domestic governmental or international levels. This course will analyze various levels at which environmental issues occur and are being addressed politically.

ENST 491C  Sustainable Cities  3 Credit Hours
In 2007, for the first time in human history, the world became an urban one with more than 50 percent of its population living in cities. The unseen influx of people into cities presents socio-ecological challenges of increasing scale. This course is a discussion of sustainability and resilience efforts (solutions-focused) in cities around the follows a multi-disciplinary approach by integrating urban-focused concepts from history, sociology, ecology, geography, and architecture and planning. Topic include, for example, air pollution and climate change, sprawl and smart growth, alternative energy, public transportation, waste management, water management, green architecture, environmental and social (in)justice, cultural diversity, and forestry and farming.

ENST 497  Seminar in Environmental Sci  1 Credit Hour
Readings, discussions and presentation of research in selected areas of study. One hour seminar.

ENST 498  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. Permission of instructor.

ENST 499  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. Permission of instructor.

Film Studies
Designed as an interdisciplinary program, the minor/Integrative Studies concentration provides an intellectually challenging and cross-culturally oriented approach to the study of cinema. Courses fulfilling the Film Studies Minor are housed in Journalism and Screen Studies (JASS).

Minor or Integrative Studies Concentration Requirements
Prerequisite

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>JASS/ENGL/HUM 248</td>
<td>Introduction to Screen Studies</td>
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Required Courses
15 credit hours in upper level credit as outlined below:

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<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>JASS 440</td>
<td>Theory of the Screen</td>
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<tr>
<td>Four courses from the following (CAOF)</td>
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<tr>
<td>JASS/ENGL 370</td>
<td>Narratives of Film and Lit</td>
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<tr>
<td>JASS 385</td>
<td>Black Cinema</td>
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<tr>
<td>JASS/WGST 387</td>
<td>Gender,Sex,Power Screen Studies</td>
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<tr>
<td>JASS 398</td>
<td>Independent Study in JASS</td>
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<tr>
<td>JASS 404</td>
<td>Video Game Studies &amp; Criticism</td>
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<tr>
<td>JASS 406</td>
<td>History&amp;Theory of Documentary</td>
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<tr>
<td>JASS 421</td>
<td>Environmental Filmmaking</td>
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<tr>
<td>JASS 440</td>
<td>Theory of the Screen</td>
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<td>JASS/HUM 457</td>
<td>American Cinema</td>
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<tr>
<td>JASS/ENGL/HUM 467</td>
<td>Script-Writing Workshop</td>
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</table>

Total Credit Hours 15

Film Studies (FILM)
Please see Journalism and Screen Studies (p. 416) (JASS) for descriptions of the film studies courses listed above.
French Translation

The Certificate in French Translation is designed to provide broad exposure to the interdisciplinary study and methods of translation as well as an academic grounding in translation theory and practice. During the certificate completion process, students combine the study of the culture and language of the Francophone world. The certificate allows students to explore the practice of translation from multiple perspectives: cultural, theoretical, interdisciplinary, and practical. The certificate also combines a rigorous study of the French language to the many obstacles in translating cultural concepts and idiomatic sentences that are very often different in the two languages, as well as practice in socioloc and standard French. Students will be exposed to a wide range of genres in both languages, including literary, business, advertisement, and business memorandums in order to improve the range of their linguistic skills.

The certificate in French Translation will provide students with the linguistic, cultural, and practical tools to tackle a variety of translation tasks in a professional setting, and thus, offer them technical skills in the fields of immigration, business, transportation, information, engineering, literature, and diplomacy such as in Consulates and Embassies, and Chambers of Commerce across the world. Indeed, in the Detroit metropolitan area alone, there are dozens of translation service agencies that need translators. Students with a Certificate in French Translation will be able to find work more easily and readily.

Certificate Requirements

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<td>Core Courses</td>
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<tr>
<td>FREN 301</td>
<td>Advanced Conversation and Comp</td>
<td>3</td>
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<tr>
<td>FREN 355</td>
<td>Introduction to Translation</td>
<td>3</td>
</tr>
<tr>
<td>FREN 408</td>
<td>Writing and Translating</td>
<td>3</td>
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<tr>
<td>Elective Course</td>
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<tr>
<td>FREN 302</td>
<td>Advanced Conversation and Comp</td>
<td>3</td>
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<tr>
<td>or FREN 308</td>
<td>Advanced Writing</td>
<td></td>
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<tr>
<td>Total Credit Hours</td>
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<td>12</td>
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</tbody>
</table>

Notes:
1. No courses may be taken as pass/fail.
2. A GPA of 2.5 is necessary to earn the certificate.
3. All credits earned in this certificate can be applied toward the French Studies major or minor, toward the International Studies-French major, and other certificates.

French/French Studies

The Bachelor of Arts in French Studies offers students a thorough training in the language and culture of the 200 million people who live in France and other francophone areas in the world.

In so doing, it familiarizes them with a vital and influential tradition in literature and the arts which spans twelve centuries and a language of importance in the realms of business, politics, science and technology.

French Studies recognizes the need to provide today's students with a broad education in French. Consequently, it requires concentrators to complete coursework in four general areas: language (including the specialized language of business), culture/civilization, film and literature.

For the same reason, French Studies takes as its purview the French-speaking world as a whole. Although it places emphasis on France, the concentration also provides an introduction to the other French-speaking countries of Europe, Asia, Africa, North America and the Caribbean which are playing roles of increasing prominence in global affairs.

UM-Dearborn offers undergraduates two degree programs involving French: International Studies and French Studies. Both are designed to enable majors to take practical advantage of the study of one of the world’s leading languages and cultures. As they complete their degree requirements, International and French Studies majors acquire knowledge and skills that prepare them for careers in numerous fields, both in the United States and abroad.

As designed, the French Studies Program offers graduates a wide variety of educational and employment possibilities. It prepares them for careers in government service, in print and electronic journalism, and in language-related professions such as translating and interpreting. It also enables them to enter the teaching profession and to pursue advanced study in French at the master’s and doctoral level. With supplementary training in areas such as political science, law, and management, graduates of the program could embark on careers in international affairs, law, and business.

Students who do not major in International Studies or French Studies may wish to choose French as a minor or a concentration in the Integrative Studies major.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:


Foundational Studies


Areas of Inquiry


- Lecture/Lab Science Course
- Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

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<td>Ancient Greek I and II</td>
<td>MCL 105 and MCL 106</td>
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<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
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<tr>
<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
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<tr>
<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
<td></td>
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<tr>
<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
<td></td>
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<tr>
<td>German I and II</td>
<td>GER 101 and GER 102</td>
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<tr>
<td>Latin I and II</td>
<td>LAT 101 and LAT 102</td>
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<tr>
<td>Spanish I and II</td>
<td>SPAN 101 and SPAN 102</td>
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</tbody>
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Prerequisites to the Major
Students majoring in French Studies must successfully complete FREN 202 or demonstrate equivalent French language proficiency.

Major Requirements
A minimum of 24 credit hours in upper-level French (FREN) classes must be completed as outlined below:

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<tr>
<td>FREN 301</td>
<td>Advanced Conversation and Comp</td>
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<tr>
<td>FREN 302</td>
<td>Advanced Conversation and Comp</td>
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Specialized Language Course (CAFS)
Select one of the following:

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<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>FREN 305</td>
<td>Language of Business</td>
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<tr>
<td>FREN 306</td>
<td>Cult Intro to French Business</td>
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<tr>
<td>FREN 308</td>
<td>Advanced Writing</td>
<td></td>
</tr>
<tr>
<td>FREN 355</td>
<td>Introduction to Translation</td>
<td></td>
</tr>
<tr>
<td>FREN 408</td>
<td>Writing and Translating</td>
<td></td>
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</tbody>
</table>

Civilization/Culture Course (CAFC)
Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 336</td>
<td>French Civilization of Past</td>
<td>3</td>
</tr>
<tr>
<td>FREN 337</td>
<td>France in the 20th Century</td>
<td></td>
</tr>
<tr>
<td>FREN 338</td>
<td>France of Today</td>
<td></td>
</tr>
<tr>
<td>FREN 339</td>
<td>Francophone Lit and Civil</td>
<td></td>
</tr>
<tr>
<td>FREN 375</td>
<td>Parisian Itineraries</td>
<td></td>
</tr>
</tbody>
</table>

Minor or Integrative Studies Concentration Requirements

Minor or Integrative Studies
Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in French (FREN).

FREN 101 French Language & Culture I 4 Credit Hours
Full Course Title: Introduction to French Language and Culture I - First course in a two-course elementary French sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in the French-speaking world. (F).

FREN 102 French Language & Culture II 4 Credit Hours
Full Course Title: Introduction to French Language and Culture II - Second course in the two-course elementary sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, and writing. (W).

Notes:
1. FREN 339 and FREN 375 can be used as a literature or civilization/culture requirement, but not both.
2. A maximum of 54 hours in FREN may count in the 120 hours required for graduation.
3. At least 15 of the 24 upper level hours in French must be elected at UM-D.
4. A maximum of 3 credits of HUM 485 internship can be used in the cognate area.
FREN 201  Intermediate French I  4 Credit Hours
An intermediate language course designed to increase the student’s ability to read, speak, and write French. The course will utilize a wide range of reading selections representative of modern French prose as the basis for class discussions and written assignments. A systematic review of grammar and oral exercises should enable the student to make definite progress in conversation and composition. (F).
Prerequisite(s): French Language Placement with a score of 201 or French Language Placement with a score of 202 or French Language Placement with a score of 301 or French Language Placement with a score of 302 or FREN 102

FREN 202  Intermediate French II  4 Credit Hours
Continuation of FREN 201. Further readings in modern French prose, extensive practice in conversation and composition. (W).
Prerequisite(s): FREN 201 or French Language Placement with a score of 202 or French Language Placement with a score of 301 or French Language Placement with a score of 302

FREN 234  French Conversation  1 to 2 Credit Hours
Development of conversational skills through discussion of contemporary readings and the use of communicative activities and games. Emphasis will be placed on vocabulary acquisition by students, on improving their pronunciation, and on increasing their overall fluency in French. (S).
Prerequisite(s): FREN 102

FREN 235  Fren Conversation and Culture  2 Credit Hours
Intensive practice in developing conversational skills through a coordinated program of classroom and field activities in France. Students will read and discuss current materials of various sorts and will perform skits and other oral exercises designed to increase their fluency in French. A series of planned, extracurricular activities (visits to museums and historical monuments, viewing of plays, interviews of average Frenchmen) will enable students to profit from direct contact with the French and their culture.
Prerequisite(s): FREN 102

FREN 290  Topics in French  1 to 3 Credit Hours
Examination of problems and issues in selected areas of French. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

FREN 301  Advanced Conversation and Comp  3 Credit Hours
An advanced course in conversation, composition, and syntax. Numerous oral reports and weekly written assignments based on readings from current sources; discussion of a recent French motion picture; translation exercises and the study of specific topics in French grammar. (F).
Prerequisite(s): FREN 202 or French Language Placement with a score of 301 or French Language Placement with a score of 302

FREN 302  Advanced Conversation and Comp  3 Credit Hours
Continuation of FREN 301. (W).
Prerequisite(s): FREN 301 or French Language Placement with a score of 302

FREN 305  Language of Business  3 Credit Hours
A systematic presentation of the vocabulary and conventions of business French. Students will receive extensive training in composing business letters, reports, visas, and similar texts. They will be exposed to French practices in correspondence, accounting and record keeping. They will also be required to translate various business documents from English to French (and vice versa) and to familiarize themselves with the specialized vocabulary of computers. (O).
Prerequisite(s): FREN 301

FREN 306  Cult Intro to French Business  3 Credit Hours
An introduction to the practices and organization of the French business world. Students will learn how a typical French firm is structured and how business is normally conducted in France. Special attention will be given to those differences in organization and operation which contrast French businesses with our own. The class will also examine the impact of history and general cultural attitudes on French business practices of today. (OC).
Prerequisite(s): FREN 301

FREN 308  Advanced Writing  3 Credit Hours
Intensive practice in writing expository prose in French. Students will complete a wide variety of writing assignments (resumes, critical analyses, explications de texte, and the like) over the course of the semester. Class sessions will be devoted to the discussion of student papers and technical issues related to effective writing. Students should expect to prepare several drafts of each assignment under the close supervision of the instructor. (OC).
Prerequisite(s): FREN 301

FREN 330  Fren Lit: Md Ages-18 Century  3 Credit Hours
A survey of French literature through the Enlightenment based on the study of individual masterpieces of principal French authors: Villon, Rabelais, Montaigne, Pascal, Moliere, Racine, Montesquieu, Voltaire, and Rousseau. (OC).
Prerequisite(s): FREN 301

FREN 331  French Lit: 19th-20th Century  3 Credit Hours
The sequel to FREN 330. A survey of French literature from Romanticism to the Theater of the Absurd and the nouveau roman. Writers studied will include Balzac, Stendhal, Baudelaire, Flaubert, Proust, Gide, Camus, Sartre, Beckett, and Sarraute. (OC).
Prerequisite(s): FREN 301

FREN 332  French Cinema  3 Credit Hours
A survey of French films from the experiments of the turn of the century to the trends of the present day. Representative silent films, "classic" and "new-wave" movies of the 1930's and 50's, as well as contemporary productions will be presented in their cultural context and the contributions of major French directors to filmmaking will be highlighted. Attention will also be given to the basic elements of film as a means of expression: camera angle, distance, movement, and editing. (OC).
Prerequisite(s): FREN 301

FREN 334  Workshop in French Theater  3 Credit Hours
This course will provide a brief survey of representative masterpieces of the French theater. Students will be required to read and analyze a number of celebrated plays and then to perform selected scenes from them. (OC).
Prerequisite(s): FREN 301

FREN 336  French Civilization of Past  3 Credit Hours
An introduction to the civilization of France (from the Middle Ages to the 20th Century). This course will examine the social and historical developments and the accomplishments in the arts and literature that have combined to shape the French nation. (OC).
Prerequisite(s): FREN 301

FREN 337  France in the 20th Century  3 Credit Hours
An introduction to France of the Third, Fourth, and Fifth Republics. This course will examine the major political, social, and economic issues of France of the 20th Century as well as its contributions to literature and the arts. (OC).
Prerequisite(s): FREN 301
### FREN 338  France of Today  3 Credit Hours
An exploration of various facets of contemporary French civilization. Although students will consider historical and political developments since World War II, special attention will be given to the values and attitudes of the French, to the contrasting modes of life in Paris and the provinces, and to important forms of popular culture. (OC).
**Prerequisite(s):** FREN 301

### FREN 339  Francophone Lit and Civil  3 Credit Hours
An introduction to twentieth-century award-winning texts from the Caribbean, Canada, North Africa and West Africa. Students will analyze the strategies through which these powerful, dramatic, post-colonial writers address such issues and themes of universal relevance as love and the search for identity, while also expressing the experience and culture realities of his or her own country. Representative authors include Birago Diop, Simone Schwartz-Bart, Arlette Coustre, Anne Hebert, Roch Carrier, Michel Tremblay, and Tehar Ben Jelloun. (OC).
**Prerequisite(s):** FREN 301

### FREN 340  France's Sites of Memory  1 Credit Hour
This course complements French 336, Civilization of the Past. Students will travel to France to visit the "sites of memory" that have shaped France's collective memorial heritage, from the Roman Empire to the French Revolution, to today. Visits to the Catacombs, Roman ruins in the South of France, Roman and Gothic cathedrals, Renaissance castles, museums, royal palaces, and the Place de la Bastille will bring France's history and civilization alive, and help crystallize a material memory of France's rich culture. (OC)

**Prerequisite(s):** FREN 301

### FREN 355  Introduction to Translation  3 Credit Hours
French 355 is designed as an introduction to the art of translation from English to French and French to English. The course will enhance students' ability to translate fluently from the source language to the target language. Students will study the theory of translation; practice translating a variety of genres; improve their knowledge of written French; increase their vocabulary, sociolinguistic register, and idiomatic expressions. (YR)
**Prerequisite(s):** FREN 202

### FREN 375  Parisian Itineraries  3 Credit Hours
*“Parisian Itineraries” follows cultural developments in Paris, and literary responses to the specific nature of urban development in France in the 19th and 20th century in France. Students consider urban planning and expansion in Paris through cultural, historical, social and literary approaches, and analyze the connections between cultural voices and urban progress. The object of this course is thus the lived experience of Parisian urbanization through the various artistic representations.

**Restriction(s):**
Can enroll if Class is Freshman or Sophomore or Junior or Senior

### FREN 385  French Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in French are related to the subject matter of the second course and are discussed with a French-area faculty member. Materials are also integrated into the assignments of the second course. (F,W).
**Prerequisite(s):** FREN 202

### FREN 388  Socio-Ctrl Iss Contemp France  3 Credit Hours
The course concentrates on a series of socio-cultural issues that are debated in France today, as well as on a number contemporary cultural and artistic phenomena. Particular attention is given to discourses on otherness and on the ways in which French cultural production and media constructions have reflected, reinforced, reshaped and, in some instances, contested the country's past and current dominant ideologies, and identities.
**Prerequisite(s):** FREN 301

### FREN 390  Topics in French  3 Credit Hours
Examination of problems and issues in selected areas of French. Title as listed in schedule of classes will change according to content. Course may be repeated for credit when specific topics differ.

### FREN 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in the humanities in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. May be repeated for a maximum of 6 credit hours. (F,W).

### FREN 408  Writing and Translating  3 Credit Hours
A course designed to increase the written fluency of students who have already assimilated the advanced grammatical concepts introduced in the 301-302 sequence. Students will prepare weekly written assignments and will translate and analyze passages written in various styles. (OC).
**Prerequisite(s):** FREN 301 and FREN 302

### Geography

**Minor or Integrative Studies Concentration only**

Geography is an integrative discipline that focuses on the interrelationships between the physical and human environments.

Geographers investigate the physical landscape (e.g., landforms, climate, biosphere) and spatial patterns of human activity within the environment (e.g., urbanization, migration, spread of diseases, desertification, global change). By integrating the physical and the human environments, Geographers bring a unique perspective to the study of pressing societal problems and issues, such as natural disaster relief and urban sprawl. This perspective is strongly enhanced by a suite of spatial analytical tools (e.g., cartography, remote sensing, Geographic Information Systems). With its spatial analytical tools and broad perspectives on the physical and cultural world, geography provides useful skills and knowledge for students in a variety of fields from urban and land use planning to business, resource management, and international development.
Geographic knowledge and thinking enables one to understand the constantly changing places, people, patterns, and connections in the world today. There has never been a time of more mobility of people, information, and ideas, which makes understanding the spatial context of places and interactions very important.

A student must complete the following requirements for the minor or concentration in geography:

**Minor or Integrative Studies**

**Concentration Requirements**

**Prerequisites**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG/ENST</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>203</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG/ENST</td>
<td>Landforms</td>
<td>3</td>
</tr>
<tr>
<td>204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/ENST</td>
<td>Cultural Geography</td>
<td>3</td>
</tr>
<tr>
<td>201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG 205</td>
<td>Geography of the United States</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 206</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours**

6

**Required courses**

12 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 302</td>
<td>Mapping Our World</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/ENST</td>
<td>Global Climate Change</td>
<td>3</td>
</tr>
<tr>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOL 350</td>
<td>Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 301</td>
<td>Environmental Science</td>
<td>3</td>
</tr>
<tr>
<td>ESCI/GEOL</td>
<td>Groundwater Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>375</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours**

9

**Physical Geography courses:**

**Human Geography courses:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 483</td>
<td>Urban Economics</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/ENST</td>
<td>Urban Geography</td>
<td>3</td>
</tr>
<tr>
<td>300/STS 308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG/ENST</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>310/STS 309</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG 325</td>
<td>Global Cities</td>
<td>3</td>
</tr>
<tr>
<td>HIST/STS 3695</td>
<td>American City</td>
<td>3</td>
</tr>
<tr>
<td>POL/CRJ 323</td>
<td>Urban Politics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Regional Geography courses:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 307</td>
<td>Geography of Western Europe</td>
<td>3</td>
</tr>
</tbody>
</table>
GEOG 305  Intro to GIS  4 Credit Hours
The basic elements of geographic information systems, map interpretation and map design. Principles and methods of spatial data collection, analysis, and display are introduced. (W)
Prerequisite(s): GEOG 302
Corequisite(s): GEOG 305L
GEOG 305D  Intro to GIS & Cartography Dis  0 Credit Hours
Required discussion session for GEOG 305.
Corequisite(s): GEOG 305
GEOG 307  Geography of Western Europe  3 Credit Hours
An analysis of the strengths, weaknesses, interrelationships, and interdependence of selected countries of this economically advanced region. (OC).
GEOG 310  Economic Geography  3 Credit Hours
Spatial aspects of the ways people make their living. Discussion of the spatial distribution of resources and wealth at various scales. Introduction of site selection and location analysis.
GEOG 315  Political Geography  3 Credit Hours
The spatial dimensions of political activity from the local to the global scale. Themes include: control of territory, relations among political entities, and political ideology.
GEOG 320  Global Climate Change  3 Credit Hours
This course explores concepts and current thinking on global climate change and environmental impacts. It covers the history of Earth’s climate, causes of climate change and current research attempting to forecast change. The biotic, economic, and social implications of climate change are discussed. (AY)
Prerequisite(s): GEOG 203 or ENST 203
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior
GEOG 325  Global Cities  3 Credit Hours
The course focuses on comparing the urban form, economies, and social life in cities around the world. The societies of the westernized, developed world are already highly urbanized. Cities outside of this sphere are generally growing much faster and experiencing greater social and economic upheaval as a result. Understanding non-North American urbanization is a vital part of understanding cities in general. (F)
GEOG 327  Michigan Geography  3 Credit Hours
A geographic study of landforms, waterways, natural resources, landmarks and economic activities that contribute to the physical and cultural landscapes of Michigan. Population, industry, agriculture, recreation and tourism will all be considered. (S, W, YR)
GEOG 390  Topics in Geography  1 to 3 Credit Hours
Selected topics to be announced. (OC).
GEOG 390B  Topics in Geography  1 to 3 Credit Hours
TOPIC TITLE: Global Climate Change. This course explores concepts and current thinking on global climate change and environmental impacts. It covers the history of Earth’s climate, causes of climate change and current research attempting to forecast change. The biotic, economic, and social implications of climate change are discussed.
GEOG 399  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and the advising instructor.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Geological Science
The Bachelor of Science in Geological Sciences provides students with a strong background in geology, astronomy, and oceanography. It enables them to study and understand processes that have shaped the Earth and the solar system over the last 4.6 billion years.

Students will learn about both the internal and surface processes acting on the earth, including the forces behind plate tectonics and its surface manifestations, earthquakes and volcanoes. The Geological Sciences student will take advantage of new and developing technologies such as the use of global positioning systems and geographic information systems (GIS) in the mapping of geologic, soil, water and other environmental features.

The major leads to a Bachelor of Science degree that prepares students for graduate study in any of the geological sciences, for students who wish to qualify for a teaching certificate in Earth Science, or for students interested in the study of geology or astronomy as part of an undergraduate liberal arts education.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gedc) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

- Ancient Greek I and II: MCL 105 and MCL 106
- Arabic I and II: ARBC 101 and ARBC 102
- Armenian I and II: MCL 111 and MCL 112
- Chinese I and II: CHIN 101 and CHIN 102
- French I and II: FREN 101 and FREN 102
- German I and II: GER 101 and GER 102
- Latin I and II: LAT 101 and LAT 102
- Spanish I and II: SPAN 101 and SPAN 102

Prerequisites to the Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 144</td>
<td>Gen Chemistry IB</td>
<td></td>
</tr>
<tr>
<td>CHEM 136</td>
<td>General Chemistry IIA</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 146</td>
<td>General Chemistry IIB</td>
<td></td>
</tr>
<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 218</td>
<td>Historical Geology</td>
<td>4</td>
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Select one from the following:

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<tr>
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<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MATH 113</td>
<td>Calc I for Biology &amp; Life Sci</td>
<td>3</td>
</tr>
<tr>
<td>&amp; MATH 114</td>
<td>and Calc II for Biology &amp; Life Sci</td>
<td></td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>&amp; MATH 116</td>
<td>and Calculus II</td>
<td></td>
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Select one from the following:

<table>
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<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; PHYS 126</td>
<td>and Introductory Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; PHYS 151</td>
<td>and General Physics II</td>
<td></td>
</tr>
<tr>
<td>ASTR 130</td>
<td>Introduction to Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 131</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
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</table>

Total Credit Hours 40

Major Requirements
Minimum 35 credit hours required

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM 344</td>
<td>Quantitative Analysis</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 303</td>
<td>Geodesy &amp; Cartog. Principles</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 313</td>
<td>Earth Materials</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 350</td>
<td>Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
<td>1-3</td>
</tr>
<tr>
<td>or GEOL 478</td>
<td>Geology of the National Parks</td>
<td></td>
</tr>
</tbody>
</table>

Research/Internship
Select 3 credit hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 498</td>
<td>Independent Study in Geology</td>
<td>3</td>
</tr>
<tr>
<td>or GEOL 499</td>
<td>Laboratory and Field Research</td>
<td></td>
</tr>
<tr>
<td>ENST 385</td>
<td>Environmental Internship</td>
<td>3</td>
</tr>
<tr>
<td>&amp; ENST 485</td>
<td>and Seminar in Environ Topics</td>
<td></td>
</tr>
</tbody>
</table>

Electives in Geological Sciences
Select a minimum of 14 or 16 credit hours upper level, whichever is 14-16 needed, to reach a total of 35 credit hours for the major (14 hrs. if GEOL 478 is taken in the core, 16 hrs. if GEOL 377 is taken) from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 325</td>
<td>Principles of Organic Chem</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 330</td>
<td>Land Use Planning and Mgmt</td>
<td>4</td>
</tr>
<tr>
<td>ESCI 390</td>
<td>Topics in Environmental Sci</td>
<td>1-3</td>
</tr>
<tr>
<td>ESCI 485</td>
<td>Spatial Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEG 390</td>
<td>Topics in Geography</td>
<td>1-3</td>
</tr>
</tbody>
</table>

GEOL 300+ level, any courses that have not been used elsewhere in the major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 390</td>
<td>Current Topics in Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 421</td>
<td>Astrophysics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 490</td>
<td>Topics in Physics</td>
<td>1-3</td>
</tr>
</tbody>
</table>

1 May be repeated.
2 The research or internship must culminate in an oral or poster presentation.

Graduate level (500+ level) courses in Geology (GEOL) can be taken for upper-level credit to satisfy major requirements by Petition.

Notes:

1. At least 12 of the 35 upper level credit hours in the major must be elected at UM-Dearborn.
2. A maximum of 6 hrs. of independent study/research in any Dept. of Natural Sciences discipline may count towards the 120 hours required to graduate.

Geology

The minor/concentration in Geology is open to students in all majors to provide curricular depth in geosciences. Selection of courses at the 300- or 400-level will depend on the major and interests of the student.
Minor or Integrative Studies Concentration Requirements
A minor or concentration in geology (GEOL) consists of 12 credit hours of upper-level courses in GEOL.

See Geospatial Analysis & Mapping (GAM) Certificate (p. 384)

GEOL 118  Physical Geology  4 Credit Hours
An introduction to the study of geologic processes at work in the earth’s interior and on its surface. Rocks and minerals, the origin and evolution of the continents, and the gradual and catastrophic processes that shape surface and bedrock features. Three hours lecture, three hours laboratory. (W).
Corequisite(s): GEOL 118L

GEOL 218  Historical Geology  4 Credit Hours
A generalized study of the history of the earth, with emphasis on the fossil record of life development, the stratigraphic sequence of deposits and paleogeography. Laboratory work will include the study of geologic and topographic maps and fossils of prominent invertebrate phyla. (YR).
Corequisite(s): GEOL 218L

GEOL 303  Geodesy & Cartog. Principles  3 Credit Hours
Understanding the shape, texture, and structure of the Earth’s surface and interior is of critical importance for studying and visualizing the physical world around us. This course focuses on the physical and geographical properties of the Earth’s surface, how these properties are measured, and how they are effectively displayed as maps and other visual representations. Surveying, Global Positioning Systems (GPS), and cartographic design both microscales (e.g., meter) and macroscales (e.g., light year) are heavily emphasized. (F, YR)

GEOL 305  Intro to GIS  4 Credit Hours
An introductory course that examines the digital representation, manipulation, and analysis of geographic data, with the emphasis on the analytical capabilities that GIS brings solutions to geographic problems. Students will explore and learn GIS principles using ESRI’s mapping software, as well as complete a major GIS project.
Corequisite(s): GEOL 305L

GEOL 305D  Intro to GIS  0 Credit Hours
Required discussion session for GEOL 305.
Corequisite(s): GEOL 305

GEOL 313  Earth Materials  4 Credit Hours
This course provides a detailed look at the physical and chemical components that constitute the Earth’s surface and subsurface. Critical elements of mineralogy, igneous and metamorphic petrology, sedimentology, and stratigraphy are covered. Laboratory sessions allow students to master the use of a petrographic microscope and sedimentary processes, among other related topics. Field sessions allow for students to identify geologic materials in their natural exposed settings. (W, AY)
Prerequisite(s): CHEM 134 and GEOL 118

GEOL 332  Hazardous Waste Management  3 Credit Hours
Environmental problems associated with solid and hazardous waste. Regulations governing the generation, transport, and disposal of hazardous waste. Waste management techniques, including reduction, reuse, recycling, treatment, incineration, and land disposal. Three hours lecture.
Prerequisite(s): GEOL 118 or ESCI 275

GEOL 340  Remote Sensing  3 Credit Hours
This course explores the acquisition, processing, and visualization of remotely derived data, with a particular emphasis on local and environmental applications. ENST 340 covers concepts and foundations of aerial and orbital remote sensing, visual interpretation, reflectance and emission spectroscopy, active and passive sensors, topography, and digital image processing software and techniques.

GEOL 342  Physical Oceanography  3 Credit Hours
An introduction to physical and chemical oceanography, fundamental marine processes and plate tectonics. Interactions between the oceans and atmosphere and the effect of greenhouse gases on the oceans and the role of physical processes in global climate change will be studied.

GEOL 350  Geomorphology  4 Credit Hours
This introductory course is designed to familiarize students with the fundamentals of river behavior and the general principles in fluvial morphology, sedimentation, and hydraulics and stream bank erosion. Applications of these principles are shown utilizing a stream classification system. Problem solving techniques for watershed management, stream restoration, non-point source pollution and integration of ecosystem concepts in watershed management are presented. A combination of both lecture and field applications are provided. (F, AY)
Prerequisite(s): GEOL 118 or (GEOG 203 and GEOG 204)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

GEOL 370  Environmental Geology  3 Credit Hours
Interactions between people and the physical environment. Geological hazards and natural processes, such as earthquakes, volcanism, floods, landslides, and coastal processes. Relationships between geology and environmental health, including chronic disease, water use and pollution, waste disposal, mineral resources, and energy use. Three hours lecture. (AY).
Prerequisite(s): GEOL 118

GEOL 372  Energy Resources  3 Credit Hours
Origin and development of fossil fuels (petroleum, coal, natural gas) and of radioactive ores used in nuclear power. Renewable and alternative energy sources, including hydro, solar, wind, biomass, and geothermal power. Environmental impacts of energy use. Three hours lecture. (AY).
Prerequisite(s): GEOL 118 or ESCI 275 or ESCI 301

GEOL 375  Groundwater Hydrology  4 Credit Hours
Prerequisite(s): GEOL 118

GEOL 377  Field Methods  1 Credit Hour
A week-long intensive field course dealing with geological field methods and analysis of geological terrains. Use of Brunton compass and clinometer, recognition and identification of geological structures, preparation and interpretation of geological maps, and use of aerial photographs. May be repeated for credit when destination varies. Organizational meeting followed by one-week trip. (YR).
Prerequisite(s): GEOL 118

GEOL 390  Current Topics in Geology  1 to 3 Credit Hours
A course in special topics current to the field of geology. Topics and format for the course may vary. See current Schedule of Classes. (OC).
Prerequisite(s): GEOL 118
GEOL 440  Advanced GIS Applications  3 Credit Hours
This course offers an opportunity for students with a background in the fundamentals of geographic information systems (GIS) to apply the analytical capabilities of geospatial technology to model real-world situations in support of decision making. Particular emphasis is given to data development and management, spatial and statistical analyses, customization, and effective visualization. 
Prerequisite(s): GEOL 305 or ESCI 305 or GEOG 305

GEOL 470  Geodatabase Design & Mgmt  3 Credit Hours
Full Title: Geodatabase Design & Management This course focuses on the design, creation, and management of geodatabases. Topics include database theory, database models, spatial data standards, the collection and pre-processing of geospatial data, topology and topological relationships, metadata creation and storage, and cloud computing. (AY, F) 
Prerequisite(s): GEOL 305 or ESCI 305 or GEOG 305

GEOL 475  Contaminant Hydrogeology  3 Credit Hours
Advanced lecture treatment of selected topics in subsurface hydrology including contaminant transport and fate of organic and inorganic constituents, aquifer test analysis, and the use of modeling in the analysis of selected case histories. (AY).
Prerequisite(s): GEOL 375 
Restriction(s): Can enroll if Class is Junior or Senior

GEOL 478  Geology of the National Parks  3 Credit Hours
Study of the geology (stratigraphy, structure and geomorphology) of major national parks. Specific parks to be visited varies from year to year, enabling the course to be repeated once for credit. Emphasis is placed on taking field notes, describing rock sequences in outcrop, geologic map reading and aerial photograph interpretation. Special attention is focused on the understanding and development of cratonic sequences, particularly the regional correlation (both lithostratigraphic and time-stratigraphic) of sandstone, shale and limestone facies, and small and large scale geologic features such as folds and faults. Depending on the national park being visited the students may explore paleographic and paleoclimatic evidence from fossils as well as sedimentary structures. This is a field-oriented course requiring a significant amount of physical exertion. (AY)
Prerequisite(s): GEOL 118 and GEOL 218
Restriction(s): Can enroll if Class is Junior or Senior

GEOL 487  Groundwater Modeling  3 Credit Hours
Lecture and laboratory applications of two- and three- dimensional groundwater flow and contaminant transport problems. Visual Modflow, Modpath (-PLOT and SUTRA), MT3D and Surfer will be used to evaluate remedial alternatives (e.g. pump and treat, funnel and gate, or trench and drain systems). EPA’s Basins software combined with ESRI’s GIS software ArcView will be used to evaluate and compare the Rouge River watershed with other small-scale watersheds in Michigan. (AY)
Prerequisite(s): GEOL 375
Restriction(s): Can enroll if Class is Junior or Senior

GEOL 490  Advanced Topics in Geology  3 Credit Hours
Current topics from various areas in pure and applied geosciences will be reported upon by students, faculty and guest speakers. May include extended field trips. (OC).

GEOL 498  Independent Study in Geology  1 to 3 Credit Hours
Library research and independent study performed under the guidance of a faculty member. Permission of instructor. (F,W,S).

GEOL 499  Laboratory and Field Research  1 to 3 Credit Hours
Directed laboratory or field research performed under the guidance of a faculty member. Four to twelve hours laboratory or field study. Permission of instructor. (F,W,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Geospatial Analysis and Mapping

The Geospatial Analysis and Mapping (GAM) Program at the University of Michigan-Dearborn supports and promotes the application of geospatial technologies in education, research, and community service.

Place-based technologies are ubiquitous, from location services on Smartphones to spatial-decision support systems that guide applications in business, government, utilities & communication, natural resources, public safety, transportation, education, health & human services, and even digital humanities. It is not hard to see how place influences your particular area of study or practice! Because of the broad array of geospatial technology across a variety of disciplines and fields, people from diverse backgrounds and interests can benefit from gaining experience in GIS and Remote Sensing.

The courses required for the program are “hands-on”, balancing the development of skill and confidence with the knowledge to solve complex spatial and temporal problems. Most of the courses are project-based, where students use GIS, or develop tools, to solve real world problems; thus, when finished, students have a portfolio of deliverables that reflect newly acquired technical and critical thinking skills.

The GAM Certificate provides students with the experience and knowledge in the theory and application of GIS and remote sensing. Students learn the basic components of GIS and spatial data, understand problems that arise in the data acquisition and analysis and develop a sound background in cartographic principles. Many students could increase their marketability with a GAM certificate. This includes (but is not limited to) careers in public health, criminal justice, sociology, economics, social and natural science education, computer engineering, Earth and environmental science or studies, urban and regional studies, and anthropology/archaeology.

Most courses are offered in the evening, such that non-degree seeking students can attend; several are also hybrid in design with online lecture and laboratory sessions on campus.

Students of any UM-Dearborn major with a GPA of 2.5 or higher can apply for this program. Non-degree seeking postgraduates must apply through the CASL Campus Option Program.

Our Alumni

Students who have participated in this program have received internships/employment at Michigan Department of Transportation (MDOT), Michigan Tech Research Institute, numerous consulting firms (i.e. FTC&H), municipalities (i.e. Livonia, Novi), and private organizations.
Additionally, several graduates have continued their GIS education in reputable postgraduate programs throughout the U.S.

**Contact us**

Please visit the GAM webpage or contact the GAM Program Director with any questions:

Dr. Jacob Napieralski  
University of Michigan - Dearborn  
Department of Natural Sciences  
4901 Evergreen Road  
Dearborn, MI 48128

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Courses (10 credit hours):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOL/ESCI/ GEOG 305</td>
<td>Intro to GIS (Tier I)</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 440</td>
<td>Advanced GIS Applications (Tier II)</td>
<td>3</td>
</tr>
<tr>
<td>Independent Study/Research/Internship - 3 credit hours of 498/499 Independent Study or Directed Research or Geospatial Internship with Program Director approval required by Petition. (Tier III)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives (6 credit hours):</strong></td>
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<tr>
<td>Choose from any of the following:</td>
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<td>6</td>
</tr>
<tr>
<td>GEOL 303</td>
<td>Geodesy &amp; Cartog. Principles (Tier I)</td>
<td></td>
</tr>
<tr>
<td>GEO/ENST 340</td>
<td>Remote Sensing (Tier I)</td>
<td></td>
</tr>
<tr>
<td>ESCI 485</td>
<td>Spatial Analysis (Tier II)</td>
<td></td>
</tr>
<tr>
<td>GEOL 470</td>
<td>Geodatabase Design &amp; Mgmt (Tier II)</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

1. 498 (Independent Study) credits can be taken in any discipline but to count toward the certificate, it must be approved by GAM Program Director by Petition.
2. 499 (Laboratory and Field Research) credits can be taken in any discipline but to count toward the certificate, it must be approved by GAM Program Director by Petition.

**NOTES:**

1. A minimum of 2.5 cumulative GPA and sophomore standing are required for admission to the program.
2. A maximum of four credit hours of transfer coursework may be counted toward the minimum 16 credit hours required for the program by Petition to the Program Director.
3. A maximum of 6 credit hours of Independent Study, Directed Research or Geospatial Internship may be counted toward the program and must be approved by the Program Director, by Petition, prior to completion.
4. A minimum 2.0 GPA in the UM-Dearborn courses counting toward the GAM certificate is required at the time of graduation and/or posting of the certificate.

**German**

German is the global language most often recommended or required for a variety of majors at many American and Canadian colleges.

These majors include, for example, history, music, international studies, art history, anthropology, philosophy, economics, political science and sociology. German is a key business language in the European Union and in the rapidly growing markets of Central and Eastern Europe. Twenty million people in the world are currently learning German as a foreign language. Germany is Michigan's largest trade partner in Europe.

The German faculty members are committed to an interactive, learner-centered approach to learning and we have designed the curriculum of German Language Program to advance students' functional language abilities and knowledge of cultures in the German-speaking world. German courses, from the first-year through the third-year, are committed to developing students' communicative language skills and cultural awareness through a variety of written, aural, visual, and tactile texts, including literature, art, architecture, music, news, film, video, and internet.

The major in International Studies - German concentration, combines an advanced curriculum in German language and culture with structured training in a professional field. The professional fields include Art Administration, Business and Management, Communications, Computer and Information Sciences, Economics, Engineering, Environmental Studies, History, Journalism and Screen Studies, Natural Sciences, or Political Science (International Affairs). A third component, cognate courses, which reinforce the international context and enable students to integrate the two primary components.

**Minor or Integrative Studies Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses in German (GER).

**GER 101**  
**German Language and Culture I**  
**4 Credit Hours**

First course in a two-course elementary German sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in the German-speaking world. (F).

**GER 102**  
**German Language and Culture II**  
**4 Credit Hours**

Second course in the two-course elementary sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, writing. (W).

**Prerequisite(s):** GER 101 or German Language Placement with a score of 102 or GER 101 German Language Placement with a score of 201 or German Language Placement with a score of 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

**GER 105**  
**Conversational German**  
**2 Credit Hours**

The course is designed to help students develop basic oral communication skills in German. Emphasis is on a maximum use of spoken German in real or simulated everyday situations during each class period. The essentials for grammar will be taught through patterns rather than analytical presentation. May not be used to fulfill the symbolic language requirement.
GER 201  German Language & Culture III  4 Credit Hours
An intermediate language course in speaking, reading, and writing German. Class assignments and discussions will be based on a wide variety of material ranging from German language films to anthologies of German prose. There will be a review of grammar, but emphasis is on reading and discussion. (F).
Prerequisite(s): GER 102 or German Language Placement with a score of 201 or German Language Placement with a score of 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 202  Intermediate German II  4 Credit Hours
A continuation of GER 201, with an even greater emphasis on reading and speaking. (W).
Prerequisite(s): GER 201 or German Language Placement with a score of 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 234  German Conversation  1 to 2 Credit Hours
Development of conversational skills through discussion of contemporary readings and the use of communicative activities and games. Emphasis will be placed on vocabulary acquisition by students, on improving their pronunciation, and on increasing their overall fluency in German. (OC).
Prerequisite(s): GER 102

GER 301  Advancing Competencies I  3 Credit Hours
Focusing on a particular topic or topics relating to the German-speaking world, students will strengthen and expand their reading, writing, speaking, listening, and cultural competencies. Students will focus on developing strategies for listening and reading more advanced primary "texts." They will have extensive practice in recognizing and imitating a variety of written and oral genres.
Prerequisite(s): GER 202 or German Language Placement with a score of 301 or German Language Placement with a score of 302

GER 302  Advancing Competencies II  3 Credit Hours
Focusing on a particular topic or topics relating to the German-speaking world, students will strengthen and expand their reading, writing, speaking, listening, and cultural competencies. Students will focus on developing strategies for listening and reading more advanced primary "texts." Students will have extensive practice in recognizing and imitating a variety of written and oral genres.
Prerequisite(s): GER 301 or German Language Placement with a score of 302

GER 305  German for the Professions  3 Credit Hours
Drawing on written and oral authentic texts, the course will focus on the proper forms of written and oral communication in a variety of professional settings in the German-speaking world. It will also stress appropriate reading and listening strategies with a focus on the potential future professions of the enrolled students.
Prerequisite(s): GER 301

GER 306  Cross-Cult Commpncy&Professns  3 Credit Hours
An in-depth study of current professional practices as carried on between agencies in the English and the German-speaking worlds. Students will focus on cultural differences, thereby strengthening cross-cultural competencies at the same time deepening their speaking, listening, writing, and reading skills.
Prerequisite(s): GER 301

GER 371  Germ Lit: Classic and Romantic  3 Credit Hours
Readings include works by Lessing, Schiller, Goethe, Meist, E.T.A. Hoffmann, and Novalis. Analyses in lectures, discussion and writing will try to illuminate the works themselves and the world views of their age. (AY).
Prerequisite(s): GER 301

GER 372  Introduction to German Lit  3 Credit Hours
A survey of German Literature from 19th century realism to the contemporary post-modernism and neo-realism. Writers studied will include both canonical and non-canonical authors, for example, Gerhard Hauptmann, Marie-Luise Fleisser, Georg Kaiser, Irmgard Keun, Bertolt Brecht, Anna Seghers, Ilse Aichinger, and Christa Wolf. The class will be a combination of lecture and discussion with a substantial writing component. (AY).
Prerequisite(s): GER 301

GER 374  The History of German Cinema  3 Credit Hours
In this course, we explore the history of German cinema through primary and secondary texts on films from the silent period through unification. Concomitantly, we will read a Mary Fulbrook's history of Germany in order to place these films within the proper historical contexts and in order to enable us to examine the ways in which German history has insinuated itself in all film genres. The film section highlights the major movement in German cinema since its inception and gives particular attention to the representations of German history and the ways in which German history makes itself apparent in a variety of genres. The class will also consider the interactions between German cinema and Hollywood through clips highlighted in lectures and student presentations. (OC).
Prerequisite(s): GER 301

GER 376  Contemporary German Cultures  3 Credit Hours
An exploration of the assumptions which underlie everyday life in German-speaking countries (Federal Republic of Germany, Austria, Switzerland). Topics include social intercourse, school systems, medicine, citizens' understanding of nation, and individuals' relationship to space. (YR).
Prerequisite(s): GER 301

GER 377  German Culture & Civilization  3 Credit Hours
Full Course Title: German Culture and Civilization-From the Romans to the Reformation- An introduction to the civilization of the German-speaking countries of Europe from the Middle Ages to the 20th Century. The course examines the arts, history, culture, and institutions that have shaped the Germanic societies.
Prerequisite(s): GER 301

GER 380  Praktikum  1 Credit Hour
This course will be offered in conjunction with a 300- or 400-level German literature, film, or cultural course in translation taught by a member of the German faculty. The one-credit course will be conducted entirely in German. Students will develop their language skills dealing with the topics of the course in translation. They will also be required to read related texts in German. Students who successfully complete the Praktikum and the corresponding German in translation course can receive four credits of German. The topics will vary depending on the English language content course. Students must be concurrently registered in appropriate 300- or 400-level courses taught by a German instructor. (OC).
Prerequisite(s): GER 301
GER 385  German Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in German are related to the subject matter of the second course and are discussed with a German-area faculty member. Materials are also integrated into the assignments of the second course. (F,W).
Prerequisite(s): GER 202

GER 390  Topics in German  3 Credit Hours
Examination of problems and issues in selected areas of German. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

GER 398  Ind Studies in German Lit  1 to 3 Credit Hours
Readings or analytical assignments in German selected in accordance with the needs and interests of those enrolled. (F,W).

GER 399  Ind Studies in German Lit  1 to 3 Credit Hours
Readings or analytical assignments in German selected in accordance with the needs and interests of those enrolled. (F,W).

GER 490  Topics in German Lit and Civ  3 to 4 Credit Hours
Examination of problems and issues in selected areas of German studies. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

GER 499  Adv Individual Proj in German  1 to 4 Credit Hours
Advanced individual study project in German language, literature, or civilization may be pursued under the direction of a faculty supervisor. (OC).

Restriction(s):
Can enroll if Class is Senior or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Global Cultures

Minor or Integrative Studies Concentration Only
The minor or concentration in Global Cultures helps students understand global systems and processes in different world regions. Deeper understanding of global change and the interdependence of the United States with the rest of the world is important to students who wish to be well informed about the contemporary world and prepared for jobs that are affected by global dynamics.

A minor in Global Cultures provides a useful complement to students majoring in a number of different areas in any of the four colleges on campus. Students wishing to study or work abroad, students working with populations from different parts of the world, and students simply wishing to expand their horizons to a more global scale, will all benefit from combining their area of study with the Global Cultures minor.
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ANTH/CRJ 455/SOC 4555/WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
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<tr>
<td>COML/HUM 355</td>
<td>Urban Voices: France and Italy</td>
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<tr>
<td>COMM 430</td>
<td>International Communications</td>
<td></td>
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<tr>
<td>COMM/WGST 455</td>
<td>Gender and Media Studies</td>
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</tr>
<tr>
<td>COMM/ANTH/SOC/WGST 481</td>
<td>Gender and Globalization</td>
<td></td>
</tr>
<tr>
<td>ENGL/WGST 445</td>
<td>20C/21C Women Authors</td>
<td></td>
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<tr>
<td>GEOG/ENST 310/STS 309</td>
<td>Economic Geography</td>
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<tr>
<td>GEOG 315</td>
<td>Political Geography</td>
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<td>GLOC/MCL 325</td>
<td>Political Islam</td>
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<tr>
<td>JASS/COMM/MCL 381</td>
<td>Postwar European Cinema</td>
<td></td>
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<tr>
<td>LIBS 364</td>
<td>The European Union</td>
<td></td>
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<tr>
<td>MCL/COML 455/</td>
<td>This American Life</td>
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<tr>
<td>POL 350</td>
<td>Pol of the Developing Areas</td>
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<tr>
<td>POL 371</td>
<td>Problems in Intl Politics</td>
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<tr>
<td>POL 385</td>
<td>Israeli-Palestinian Conflict</td>
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<td>POL 473</td>
<td>International Security Affairs</td>
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<tr>
<td>WGST 408</td>
<td>Sex, Gender and the Body</td>
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<td>Group 3: Migration and Diasporas (CAGN):</td>
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<td>AAAS 491C</td>
<td>Topics in AAAS</td>
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<tr>
<td>AAST/ENGL 381</td>
<td>Intro to Postcolonial Studies</td>
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<tr>
<td>ANTH/CRJ 455/SOC 4555/WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
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<tr>
<td>GEOG/ENST 310/STS 309</td>
<td>Economic Geography</td>
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ARBC 331 Survey of Arabic Literature 3
ARBC 332 Arabic Cinema 3
ARBC 335 Arabic Civilization 3
ARBC 350 Arabic Literature and Culture 3
ARBC 351 Contemporary Arabic Literature 3
FREN (CAFG)
FREN 305 Language of Business 3
FREN 306 Cult Intro to French Business 3
FREN 332 French Cinema 3
FREN 336 French Civilization of Past 3
FREN 337 France in the 20th Century 3
FREN 338 France of Today 3
FREN 339 Francophone Lit and Civil 3
FREN 375 Parisian Itineraries 3
GER (CARG)
GER 305 German for the Professions 3
GER 306 Cross-Cult Comptncy&Professns 3
GER 374 The History of German Cinema 3
GER 376 Contemporary German Cultures 3
GER 377 German Culture & Civilization 3
GER 390 Topics in German 3
GER 490 Topics in German Lit and Civ 3
SPAN (CASG)
SPAN 305 Language of Business 3
SPAN 356 Spanish Civilization and Cult 3
SPAN 357 Latin American Civiliztn Cult 3
SPAN 358 Spain in the Twentieth Century 3
SPAN 450 Hispanic Cinema 3
SPAN 465 Contemporary Spanish Lit 3

GLOC 234 Japanese Economy & Business 3 Credit Hours
In this course, students can obtain fundamental knowledge on stylized facts of Japanese economy as compared with those in the US and some other countries, and understand economic theories to put profound interpretations on them. Stylized facts seem to be old and some of them may have been obsolete, although they contain essential logical points. However, they are still useful for understanding Japanese economic systems. Thus, students are required to discuss current conditions on Japanese economy and firm system, considering stylized facts and theoretical backgrounds. It is essential to distinguish between changing phenomena and unchanged principles. Students have an opportunity to take a tour to a factory in a leading company. In the final class, students have to give team presentations and individually submit a short essay on the topics provided or the ones they come up with. As for the structure of the classes, we cover fundamental stylized facts, economic theories (or theoretical frameworks), and data analyses (historically and currently). This course is composed of three parts: (1) Japanese economic system, (2) Japanese firm system and (3) Japanese macroeconomic conditions.

GLOC 301 Intro to Global Cultures 3 Credit Hours
The course introduces students to the various concepts and notions attached to the phenomenon known as globalization from several disciplinary approaches including history, political science, economic, cultural geography, environmental sciences, and anthropology. It, then, delves into an in-depth examination of globalization and its ideologies, particularly the consensus as well as the controversies it engenders. The course particularly focuses on the relation between globalization and culture.

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate

GLOC 325 Political Islam 3 Credit Hours
This course is designed as an introduction to the main issues and themes in the study of political Islam and Muslim Politics, providing a broad overview of the pertinent key concepts and issues. It provides a historical approach to the study of political Islam, and touches upon the nineteenth century Islamic revivalism. It also explores diversity in contemporary Islamic thought and global Islamist movements.

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Global Engagement
The Global Engagement Certificate is designed to provide students with powerful tools to understand the international dynamics of the past, present, and future world scenario, as well as allow students to be able to apply knowledge in the contemporary market.

This Certificate can enhance other programs by providing an additional area-study of specialization. Furthermore, it is designed to complement and combine with a wide range of existing majors. In order to focus on the study and dialogue between the global and the local realities, students will be able to take advantage of existing courses in areas such as Global Mediated Cultures, Gender and Multicultural Issues in the Global World, Migration and Diasporas, and American Studies in the Global Age, as well as cognates related to global themes.

Certificate Requirements
The Global Engagement Certificate requires the following courses (12 credits total):

One course from:
COMM 430 International Communications
GLOC 301 Intro to Global Cultures

Select three courses from the following (CACG): 9
AAAS 4401 Seminar: African Diaspora
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAST 3150/  HIST 3671</td>
<td>Intro to Arab American Studies</td>
</tr>
<tr>
<td>AAST 3151/  HIST 3672</td>
<td>Public Cultural Work</td>
</tr>
<tr>
<td>AAST/AAAS/ HIST/RELS 3634</td>
<td>History of Islam in the US</td>
</tr>
<tr>
<td>AAST/HIST 3673</td>
<td>Arabs &amp; Muslims in Media</td>
</tr>
<tr>
<td>AAST/HIST 3676</td>
<td>Arab Americans Since 1890</td>
</tr>
<tr>
<td>AAST/ENGL 381</td>
<td>Intro to Postcolonial Studies</td>
</tr>
<tr>
<td>AAST/ENGL/ WGST 473</td>
<td>Arab American Women Writers</td>
</tr>
<tr>
<td>AAST/HIST 4677</td>
<td>Arab American Identity</td>
</tr>
<tr>
<td>AAST/HIST 4678</td>
<td>Middle Eastern Diasporas</td>
</tr>
<tr>
<td>ANTH 320</td>
<td>Culture and Int'l Business</td>
</tr>
<tr>
<td>ANTH 372</td>
<td>Anthropology of Latin America</td>
</tr>
<tr>
<td>ANTH 373</td>
<td>Anth Persp on the Middle East</td>
</tr>
<tr>
<td>ANTH 381</td>
<td>Who Owns the Past?</td>
</tr>
<tr>
<td>ANTH/CRJ/ SOC/WGST 412</td>
<td>Men and Masculinities</td>
</tr>
<tr>
<td>ANTH/WGST 420</td>
<td>Kinship and Marriage</td>
</tr>
<tr>
<td>ANTH/RELS 440</td>
<td>Religion and Culture</td>
</tr>
<tr>
<td>ANTH/ CRJ 455/ SOC 4555/ WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
</tr>
<tr>
<td>ANTH/COMM/ SOC/WGST 481</td>
<td>Gender and Globalization</td>
</tr>
<tr>
<td>COMM 306/ AMST 300/ ENGL 306/ HIST 3602/ SOC 306</td>
<td>Comparat. American Identities</td>
</tr>
<tr>
<td>COMM 366</td>
<td>Public Comm and Culture Studies</td>
</tr>
<tr>
<td>ENST/GEOG 320</td>
<td>Global Climate Change</td>
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<td>GEOG/ENST 300/STS 308</td>
<td>Urban Geography</td>
</tr>
<tr>
<td>GEOG/ENST 310/STS 309</td>
<td>Economic Geography</td>
</tr>
<tr>
<td>GEOG 325</td>
<td>Global Cities</td>
</tr>
<tr>
<td>HIST/ECON 362</td>
<td>Eur and Intern'l Econ History</td>
</tr>
<tr>
<td>HIST 384</td>
<td>Immigration in America</td>
</tr>
<tr>
<td>JASS/COMM/ MCL 381</td>
<td>Postwar European Cinema</td>
</tr>
<tr>
<td>LIBS 364</td>
<td>The European Union</td>
</tr>
<tr>
<td>LING/ENGL 484</td>
<td>World Englishes</td>
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<tr>
<td>MCL/COML 455</td>
<td>This American Life</td>
</tr>
<tr>
<td>POL 350</td>
<td>Pol of the Developing Areas</td>
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<td>POL 371</td>
<td>Problems in Intl Politics</td>
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<td>POL 385</td>
<td>Israeli-Palestinian Conflict</td>
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<td>POL 473</td>
<td>International Security Affairs</td>
</tr>
<tr>
<td>POL/CRJ 481</td>
<td>Terrorism &amp; US Natl Security</td>
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<tr>
<td>SOC 460</td>
<td>America in a Global Society</td>
</tr>
<tr>
<td>WGST 408</td>
<td>Sex, Gender and the Body</td>
</tr>
</tbody>
</table>

Total Credit Hours 12

NOTES:
1. A minimum 2.0 cumulative GPA is required for admission to the program.
2. No courses may be taken as pass/fail.
3. A maximum of one transfer course (three credit hours) may count toward the Certificate by petition.
4. 3 credits of study abroad, internship or co-op and 3 credits of a foreign language above the 302 level may be used with approval of the program director by petition.
5. A minimum 3.0 GPA in the courses counting toward the Certificate and a minimum 2.0 cumulative GPA are required at the time of graduation and/or posting of the certificate.

Hispanic Studies

With more than 400 million Spanish speakers, Spanish is one of the most important languages in our globalized world.

Globalization is part of the reality of the twenty-first century and speaking Spanish has almost become a necessity. Thus, the study of the Spanish language and its culture is quite practical. Given the Hispanic presence in the United States and the proximity of our Spanish-speaking neighbors in Latin America, proficiency in Spanish is increasingly advantageous and even necessary for numerous professions and careers.

The Spanish area faculty members recognize the need to provide today’s students with a broad education and perspective. To that end the Bachelor of Arts in Hispanic Studies offers three different majors as well as a minor. The three majors are:

1. Hispanic Studies
2. International Studies-Spanish concentration (see International Studies (p. 410))
3. Integrative Studies - Hispanic Studies as one of three concentrations

The College of Education, Health and Human Services offers a Secondary Certification Program for teaching Spanish to grades 7-12 (More information and details are available on secondary certification page.)

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-
Major Requirements

A minimum of 24 credit hours in upper level Spanish (SPAN) classes must be completed as outlined below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>SPAN 301</td>
<td>Adv Conversation and Comp I</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 302</td>
<td>Advan Conversation Comp II</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
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</table>

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 301</td>
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<tr>
<td>SPAN 302</td>
<td>Advan Conversation Comp II</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

**Specialized Language course (CAHS)**

<table>
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<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>SPAN 305</td>
<td>Language of Business</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

**Civilization/Culture course (CAHC)**

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 321</td>
<td>Spanish Food and Cuisine</td>
</tr>
<tr>
<td></td>
<td>Spanish Civilization and Cult</td>
</tr>
<tr>
<td></td>
<td>Latin American Civiliztn Cult</td>
</tr>
<tr>
<td></td>
<td>Spain in the Twentieth Century</td>
</tr>
</tbody>
</table>

**Literature course (CAHL)**

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>SPAN 350</td>
<td>Masterpiece of Latin Amer Lit</td>
</tr>
<tr>
<td></td>
<td>Masterpieces of Spanish Lit</td>
</tr>
<tr>
<td></td>
<td>Latino Literature</td>
</tr>
</tbody>
</table>

**400-level Language courses**

Select two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 406</td>
<td>Advanced Written Expression</td>
</tr>
<tr>
<td></td>
<td>Oral Expression</td>
</tr>
<tr>
<td></td>
<td>Introduction to Translation</td>
</tr>
<tr>
<td></td>
<td>Advanced Translation</td>
</tr>
<tr>
<td></td>
<td>Hispanic Cinema</td>
</tr>
<tr>
<td></td>
<td>Spanish Film</td>
</tr>
<tr>
<td></td>
<td>Contemporary Spanish Lit</td>
</tr>
</tbody>
</table>

**Other Spanish Area Offerings**

Select any one 300+ level SPAN

**Cognates**

Select upper level courses from the following disciplines: AAAS, ANTH, ARBC, ARTH, COMM, COML, ECON, ENGL, ENST, FREN, GEOL, GER, GLOC, HIST, HUM, JASS, LIBS (excluding LIBS 395, LIBS 396, LIBS 397), MCL, PHIL, POL, RELS, SOC, WGST.

**Notes:**

** Majors must take at least one course that deals specifically with Spanish (peninsular - CAPH) topics such as SPAN 321, SPAN 351, SPAN 356, SPAN 358, SPAN 451, or SPAN 465 and at least one course that deals specifically with Latin American topics (CALA) such as SPAN 350, SPAN 353, or SPAN 357. **

** Majors are encouraged to spend a semester or year in one of the many approved study-abroad programs. **

1. A maximum of 54 hours in SPAN may count in the 120 hours required for graduation.
2. At least 18 of the 24 upper level hours in Spanish (SPAN) must be elected at UM-D.
Minor or Integrative Studies
Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in Spanish (SPAN).

SPAN 101   Spanish Language & Culture I   4 Credit Hours
Full Course Title: Introduction to Spanish Language and Culture I-First course in the two-course elementary Spanish sequence. Listening comprehension, speaking, reading, writing, and culture are emphasized. Course materials promote the use of language to communicate with others and to function in Hispanic culture. (F,S).
Prerequisite(s): SPAN 101 or Spanish Language Placement with a score of 102 or Spanish Language Placement with a score of 201 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

SPAN 102   Spanish Language & Culture II   4 Credit Hours
Full Course Title: Introduction to Spanish Language and Culture II-Second course in the two-course elementary Spanish sequence. Continued emphasis on culture and the four skills of listening, speaking, reading, and writing. (F,W,S).
Prerequisite(s): SPAN 101 or Spanish Language Placement with a score of 102 or Spanish Language Placement with a score of 201 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

SPAN 201   Intermediate Spanish I   4 Credit Hours
An intermediate-level course designed to increase the proficiency in listening, speaking, reading, and writing within a cultural context. Emphasis is placed on acquiring new vocabulary and expanding the use of grammar structures. Course materials promote the use of language to communicate with others and to function in Hispanic culture. (F).
Prerequisite(s): SPAN 102 or Spanish Language Placement with a score of 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302 or Spanish Language Placement with a score of 302

SPAN 202   Intermediate Spanish II   4 Credit Hours
Continuation of SPAN 201 with emphasis on the development of all language skills. (W).
Prerequisite(s): SPAN 201 or Spanish Language Placement with a score of 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

SPAN 254   Spanish Conversation   2 Credit Hours
This course provides extensive oral practice to reinforce vocabulary and grammar concepts and to improve pronunciation. Conversational skills are developed through discussion and use of communicative exercises, activities, and games. (OC).
Prerequisite(s): SPAN 102

SPAN 301   Adv Conversation and Comp I   3 Credit Hours
An advanced course in conversion, composition, and syntax designed to strengthen existing skills. An intensive review of grammar combined with pronunciation and vocabulary exercises should enable the student to make progress in composition and conversation. Oral and written assignments will be based on readings from contemporary sources. (F).
Prerequisite(s): SPAN 202 or Spanish Language Placement with a score of 301 or Spanish Language Placement with a score of 302

SPAN 302   Advan Conversation Comp II   3 Credit Hours
Continuation of SPAN 301 with emphasis on the command of conversational and writing skills. (W).
Prerequisite(s): SPAN 301 or Spanish Language Placement with a score of 302

SPAN 305   Language of Business   3 Credit Hours
An introduction to the language and practices of the Hispanic world of business. Particular emphasis will be placed on learning the terminology used in typical business correspondence and documents. A variety of businesses will be examined and practice in reading and composing business letters will be provided. (AY).
Prerequisite(s): SPAN 301

SPAN 310   Intro to Hispanic Linguistics   3 Credit Hours
This class provides students with a systematic overview of key areas of Spanish linguistics, including the sound system, forms of words, syntactic patterns, the development of the language, and regional, social and contextual variation.
Prerequisite(s): SPAN 301
Restriction(s):
Can enroll if Level is Undergraduate

SPAN 321   Spanish Food and Cuisine   3 Credit Hours
Spanish 321 is a course intended to provide students with an overview of Spanish Peninsular culture, civilization and history through the analysis and exposure to its foods, products, dishes and social events around its eating habits. (OC)
Prerequisite(s): SPAN 301

SPAN 350   Masterpiece of Latin Amer Lit   3 Credit Hours
A survey of Latin American literature from the colonial period to the present. Emphasis will be placed on such influential and outstanding contemporary authors as Borges, Garcia Marquez, Paz, Poniatowska, Rosario, Ferre, and Rulfo. (AY).
Prerequisite(s): SPAN 301

SPAN 351   Masterpieces of Spanish Lit   3 Credit Hours
An overview of Spanish Peninsular literature beginning with the Medieval period. Students read and discuss outstanding works from a variety of literary periods and genres. Works by authors such as Cervantes, Lope de Vega, Calderon, Galdos, Unamuno, Lorca, and Goytisolo are included. (AY).
Prerequisite(s): SPAN 301

SPAN 353   Latino Literature   3 Credit Hours
The course offers a selection of literary representations from a range of Latino groups with an emphasis on Cubans, Dominicans, Mexicans, and Puerto Ricans in the United States. Students examine these minority groups and the realities of their migrations through a variety of literary periods and genres.
Prerequisite(s): SPAN 301

SPAN 356   Spanish Civilization and Cult   3 Credit Hours
A survey of Spanish civilization from its origins to the present. The course explores the achievements of the Spanish people in art, architecture, music, literature, and the sciences and examines aspects of contemporary Spanish institutions and society.
Prerequisite(s): SPAN 301

SPAN 357   Latin American Civiliztn Cult   3 Credit Hours
A survey of Hispanic culture in the Americas from its inception to the present. The course examines the contributions of the Latin American ethnic groups and explores the relationship between Latin America’s past and contemporary achievements and problems.
Prerequisite(s): SPAN 301
SPAN 358  Spain in the Twentieth Century  3 Credit Hours
A cultural study of the institutions, issues, and values of Spanish society in the twentieth century as seen in art, architecture, music, literature, film, and the media. Special emphasis is placed on contemporary Spain from the end of the Franco era through the development of a democracy. (OC).
Prerequisite(s): SPAN 301

SPAN 359  Three Cultures of Spain  1 Credit Hour
Spanish 359 complements Spanish 356, Civilization and Culture of Spain. In Spanish 356, students learn the culture and civilization of Spain from 711 to 1492 when Christians, Muslims and Jews were sharing territory and culture was flourishing due to the hybridity connections during these centuries. In this course, the legacy of these cultures/philosophies in Spain are studied in order to show students the importance of architecture, scientific advances (monuments, towns, castles, mosques, synagogues, old towns, ruins, and palaces) in Spain’s three cultures era. (OC).

SPAN 385  Spanish Across the Curriculum  1 Credit Hour
Course is attached to an upper-level course in another discipline and taken concurrently with it. Course materials in Spanish are related to the subject matter of the second course and are discussed with a Spanish-area faculty member. Materials are also integrated into the assignments of the second course. (OC).
Prerequisite(s): SPAN 202

SPAN 390  Topics in Spanish  3 Credit Hours
Examination of problems and issues in selected areas of Spanish. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).
Prerequisite(s): SPAN 201

SPAN 398  Independent Studies in Spanish  1 to 6 Credit Hours
Readings or analytical assignments in Spanish in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. Students may receive a maximum of six credit hours for a combination of SPAN 398 and SPAN 399. (FW).

SPAN 399  Independent Studies in Spanish  1 to 6 Credit Hours
Readings or analytical assignments in Spanish in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. May be repeated for a maximum of 6 credit hours. (FW).

SPAN 406  Advanced Written Expression  3 Credit Hours
Through the reading and analysis of authentic materials students will develop and improve their writing skill in various narrative styles such as dialogue, description, essay or research paper. Writing as a process involving editing and revision will be emphasized. (AY).
Prerequisite(s): SPAN 302

SPAN 409  Oral Expression  3 Credit Hours
A course designed to increase the conversational skills of advanced-level students. A variety of activities and assignments will help students refine their oral accuracy and expand upon the number of social situations in which they can function. (AY).
Prerequisite(s): SPAN 302

SPAN 420  Introduction to Translation  3 Credit Hours
An introduction to the history, theory and practice of English-to-Spanish and Spanish-to-English translation. Emphasis will be placed on material selected from the fields of business and commerce, the legal system, and brief passages of literature. Class projects will include translations of advertisements, brochures, and documents provided by area businesses. (AY).
Prerequisite(s): SPAN 302

SPAN 421  Advanced Translation  3 Credit Hours
The course will continue to apply the translation theory and techniques introduced in SPAN 420, and it will continue to focus on English-to-Spanish and Spanish-to-English non-literary translation. Emphasis will be placed on materials selected from the fields of business, advertising, and legal discourse. Class projects will include translation of advertisements, legal documents, and business brochures. (AYW).
Prerequisite(s): SPAN 305 and SPAN 420

SPAN 450  Hispanic Cinema  3 Credit Hours
An introduction to the history and critical analysis of representative Hispanic films of major directors from Spain and Latin America. Emphasis will be placed on the historical, political, and cultural content of these films as they reflect the problems, customs, and contradictions of Hispanic culture. (AY).
Prerequisite(s): SPAN 301

SPAN 451  Spanish Film  3 Credit Hours
An introduction to the history and critical analysis of representative Spanish films of major directors from Spain. Emphasis will be placed on the historical, political, social and cultural content of these films as they reflect the problems, customs, and contradictions of Spanish culture.
Prerequisite(s): SPAN 301

SPAN 456  Contemporary Spanish Lit  3 Credit Hours
Spanish 465 provides students with an overview of Contemporary Spanish Peninsular literature and culture through the analysis of narrative texts. Selected readings provide the basis for stylistic and textual analysis. Fostering critical thinking through an analysis of texts is the primary focus of the class. The course specifically examines narrative works that belong to the Spanish literary canon produced after the end of an almost forty year dictatorial regime in 1975. The literary works are deeply rooted in Spain’s social and cultural history. Consequently, they describe the contemporary socio-political scene in which they were produced and look at the uncertain future of this reborn nation.
Prerequisite(s): SPAN 301
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

SPAN 490  Topics in Spanish  3 Credit Hours
Examination of problems and issues in selected areas of Spanish language, literature, culture and/or civilization. Title as listed in the Schedule of Classes changes according to content. Course may be repeated for credit when specific topic differs. (OC).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

History
History students at UM-Dearborn research a wide variety of topics, periods and areas of the world, and practice many modes of historical thinking.

At the end of their studies, history majors are able to frame and investigate questions about the actions, contexts, and meanings of earlier human lives from cultural, economic, political, and social perspectives. Producing original historical research, students locate and interpret primary sources as evidence, place their inquiries in the context...
of relevant historiography and broader frameworks of interpretation, and integrate varied sources in a coherent argument.

Advising
History majors should consult with an adviser before the beginning of each semester.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

Prerequisites to the Major
Students desiring to major in history are required to elect three of the following courses as prerequisites. The faculty strongly advises that students take these courses during their freshman or sophomore year.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HIST 3602</td>
<td>Comparat. American Identities</td>
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<tr>
<td>AMST 300</td>
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<td>COMM 306</td>
<td></td>
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<td>ENGL/SOC</td>
<td></td>
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<tr>
<td>306</td>
<td></td>
</tr>
<tr>
<td>HIST/ECON</td>
<td>United States Economic History</td>
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<tr>
<td>361</td>
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<tr>
<td>HIST/RELS</td>
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<td>HIST 3632</td>
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<td>HIST/WGST</td>
<td>Women Leadership/Social Change</td>
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<td>HIST 3665</td>
<td>Automobile in American Life</td>
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<td>Henry Ford and His Place</td>
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<td>Public Cultural Work</td>
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<td>HIST/AAAST</td>
<td>Arabs &amp; Muslims in Media</td>
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<td>HIST/AAAS</td>
<td>Civil Rights Movement in Amer</td>
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<td>American City</td>
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<td>Women in Am-Hist Perspective</td>
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<td>HIST 371</td>
<td>American Ideas, 1607-1865</td>
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<td>HIST 384</td>
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<td>HIST/STS</td>
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**Non-U.S. History (CANU)**

Select three courses from the following: 9

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HIST 302</td>
<td>Russian Intellectual History</td>
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<tr>
<td>HIST 303</td>
<td>The Birth of Civilization</td>
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<td>HIST 306</td>
<td>20th-C Russian Intel History</td>
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<td>HIST 307</td>
<td>Early Russian History</td>
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<td>HIST 308</td>
<td>Imperial Russia</td>
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<td>HIST 309</td>
<td>The Russian Revolutions</td>
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<tr>
<td>HIST 3121</td>
<td>Polish History Since 1800</td>
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<td>HIST 3122</td>
<td>Poland - Study Abroad</td>
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<td>HIST 3125</td>
<td>Modern East-Central Europe</td>
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<td>HIST 3130</td>
<td>Armenia Ancient Medieval World</td>
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<td>HIST 3131</td>
<td>Armenia in the Soviet Period</td>
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<td>HIST 3132</td>
<td>Armenians in the Modern World</td>
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<td>HIST 314</td>
<td>England: Tudors and Stuarts</td>
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<td>Modern Britain</td>
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<td>HIST 321</td>
<td>Late Imperial China</td>
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<td>Traditional China</td>
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<td>History of Modern China</td>
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<td>HIST 326</td>
<td>Modern Japan</td>
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<td>HIST 329</td>
<td>Medieval Society</td>
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<td>HIST 3368</td>
<td>Germany Since 1945</td>
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<td>HIST 3380</td>
<td>The European City, 1750-2000</td>
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<td>HIST/WGST</td>
<td>Sex, War, and Violence</td>
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<td>HIST 3390</td>
<td>20th c European Women's Hist</td>
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<td>HIST 330</td>
<td>The Renaissance</td>
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<td>HIST 331/</td>
<td>The Reformation Era: 1500-1648</td>
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<td>HIST 333</td>
<td>The Age of Revolution in Europe and the World</td>
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<td>Europe in Age of Imp:1815-1914</td>
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<td>20th-Century Europe, 1890-1945</td>
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<td>Germany Before Hitler</td>
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<td>HIST/AAAS</td>
<td>West Africa Since 1800</td>
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<td>HIST 3502</td>
<td>The Middle East 570 to 1800 CE</td>
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<td>HIST 3511</td>
<td>Modern Middle East, 1918-1945</td>
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<td>HIST 3512</td>
<td>Modern Middle East, 1945-1991</td>
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<td>HIST 3520</td>
<td>Lebanon in Modern Middle East</td>
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<td>HIST 354</td>
<td>The United States and Vietnam</td>
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<td>Eur and Intern'l Econ History</td>
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<td>Bible in History</td>
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<td>HIST 3750</td>
<td>Modern Warfare</td>
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<td>HIST 378</td>
<td>History of Consciousness</td>
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### Minor or Integrative Studies

**Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses in history (HIST).

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<tr>
<th>Course</th>
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<td>Aspects of the Holocaust</td>
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<td>HIST/HUM 389</td>
<td>Nazi Germany</td>
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</table>

**Capstone**

Select six hours of courses at the 400 or 4000 level. ²

**Upper Level Electives in History**

Select 3 credit hours any upper level HIST

**Portfolio**

Approval required by the History faculty advisor. ³

**Cognates**

Six credit hours upper level courses in African and African American Studies (AAAS), American Studies (AMST), Anthropology (ANTH), Arab American Studies (AAST), Arabic (ARBC), Art History (ARTH), Communications (COMM), Economics (ECON), English (ENGL), French (FREN), Geography (GEOG), German (GER), Humanities (HUM), Linguistics (LING), Music History (MHIS), Philosophy (PHIL), Political Science (POL), Psychology (PSYC), Religious Studies (RELS), Spanish (SPAN), Sociology (SOC), Urban and Regional Studies (URS), and Women and Gender Studies (WGST).

| Total Credit Hours | 33 |

¹ May count as U.S. or Non U.S., but not both.
² May include HIST 4999 (Senior Research Seminar), HIST 498 (Senior Honors Thesis), HIST 499 (Advanced Independent Studies in History), and any of the 400 or 4000 level advanced seminar courses.
³ Completion of an electronic history portfolio is required. Please see the History Portfolio (https://umdearborn.edu/casl/undergraduate-programs/areas-study/history/history-portfolio/) page for more information.

**Notes:**

1. At least 15 of the 27 upper level credit hours in history (HIST) must be elected at UM-Dearborn.
2. A maximum of 3 hours of History Internship (HIST 3085) may count in the major.

**Portfolio**

In order to graduate with a degree in history, students must compile an electronic portfolio of papers written in history courses. The History Portfolio (https://umdearborn.edu/casl/undergraduate-programs/areas-study/history/history-portfolio/) is an archive of at least four significant papers from upper-division history courses taken at UM-Dearborn. It must include the HIST 300 paper and at least one paper from a capstone (400/4000 level) course, along with a capstone reflection essay that highlights those papers that best demonstrate mastery of learning outcomes for history majors.

**Minor or Integrative Studies**

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**Minor or Integrative Studies**

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**Capstone**

Select six hours of courses at the 400 or 4000 level. ²

**Upper Level Electives in History**

Select 3 credit hours any upper level HIST

**Portfolio**

Approval required by the History faculty advisor. ³

**Cognates**

Six credit hours upper level courses in African and African American Studies (AAAS), American Studies (AMST), Anthropology (ANTH), Arab American Studies (AAST), Arabic (ARBC), Art History (ARTH), Communications (COMM), Economics (ECON), English (ENGL), French (FREN), Geography (GEOG), German (GER), Humanities (HUM), Linguistics (LING), Music History (MHIS), Philosophy (PHIL), Political Science (POL), Psychology (PSYC), Religious Studies (RELS), Spanish (SPAN), Sociology (SOC), Urban and Regional Studies (URS), and Women and Gender Studies (WGST).

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**Minor or Integrative Studies**

**Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses in history (HIST).
HIST 112  The American Past II  3 Credit Hours
A survey of the economic, social, and political developments in America from the conclusion of the Civil War through the present.

HIST 290  Topics in History  3 Credit Hours
Problems and issues in selected areas of history. Title listed in Schedule of Classes changes according to content. Courses may be repeated for credit when specific topics differ. (OC).

HIST 291  Topics in History  3 Credit Hours
Problems and issues in selected areas of history. Title listed in Schedule of Classes change according to content. Courses may be repeated for credit when specific topics differ. (OC).

HIST 300  The Study of History  3 Credit Hours
A study of the theories of historical analysis, styles of historical writing, and approaches to historical research. For history majors who should elect it as soon as they declare their concentration. (FW).
Prerequisite(s): HIST 101 or HIST 102 or HIST 103 or HIST 104 or HIST 105 or HIST 111 or HIST 112 or HIST 113 or HIST 114

HIST 302  Russian Intellectual History  3 Credit Hours
Examines the historical myths that supported traditional Russian institutions, the literature that expressed these myths in symbolic form, the relationships between the social classes, and the conflict of values and goals in 19th-century Russia. Through the literature of the period the course explores social, intellectual, and political movements. The material is organized to consider both revolutionary and reactionary ideologies, origins of each, and the dynamics between them. (AY).

HIST 303  The Birth of Civilization  3 Credit Hours
Course examines the nature of the intellectual structure of the ancient Egyptians, Mesopotamians and Hebrews, and the social structures and historical developments of those cultures. Emphasis is on the evolution of civilization, the contrasts between Egypt and Mesopotamia, and most importantly, the shifts from mythical to philosophical thinking and discourse. (OC).

HIST 304  Studies in Det. Hist & Culture  3 Credit Hours
This interdisciplinary course explores the political, social, and cultural history of Detroit by examining ways various groups and classes have interacted with and been shaped by structures of power and influence. The course highlights trade and commerce, newcomers, and the influence of organizations and institutions within the contexts of labor, race, ethnic, and religious histories and current affairs, and examines how these fit into the evolution of Detroit from the 19th century to the present. Where pertinent the influence of national and international movements included.

HIST 305  The Arts & Culture of Detroit  3 Credit Hours
This interdisciplinary course explores the modern and contemporary cultural history of Detroit, examining the ways in which various population groups have been creative from the nineteenth century to the present. The course highlights the work of architects, designers, photographers, visual artists, poets, and musicians, and situates them in the broader cultural context of American art and history.

HIST 306  20th-C Russian Intel History  3 Credit Hours
Study of the relationships between revolutionary philosophies and actions; the dilemma of the Russian Revolution and the dilemma of its "success"; the interaction of art, literature, and revolutionary movements. The course examines historical developments through novels, poetry, and philosophy. (AY).

HIST 307  Early Russian History  3 Credit Hours
A history of Russia from its prehistoric origins to the beginning of the 19th century, focusing on political and economic development, cultural and religious dynamics, foreign relations, and expansion in Asia. Stress is placed on political dynamics, including the forces of democracy in Russia's past. (AY).

HIST 308  Imperial Russia  3 Credit Hours
A history of Russia from the time of Peter the Great to the Russian revolutions of 1917. Attention is given to internal affairs, economic development, foreign relations, the failure of reforms, and the emergence of the revolutionary movement. (AY).

HIST 3085  History Internship  3 to 6 Credit Hours
The internship offers students experience in types of work available to liberal arts graduates. Regular meetings between the Internship Coordinator and the intern are required. Students can count up to 3 credits of History Internship (HIST 3085) as an upper-level history course in the degree requirements for the history major.

HIST 309  The Russian Revolutions  3 Credit Hours
Provides a broad overview of Russian history leading to the Russian revolutions of 1917, and a more detailed analysis of the revolutions of 1905 and 1917 and the subsequent development of the Soviet Union up to the present. Roots of present Soviet behavior will be sought in Russia's past. (AY).

HIST 3121  Polish History Since 1800  3 Credit Hours
This class offers students a chance to study 19th and 20th century Polish history. We look at how the most prominent ideals of what it means to be Polish – framed as a discussion between the Romantics and Positivists; the Fighters/Insurgents and Realists; the Old and New – affected the perceptions on honor, heroism, and Polish patriotism. A critical evaluation of these models leads us to evaluate the most important historical events in the last two centuries of Polish history – a country with impressive history of openness and multiculturalism as well as grim chapters of xenophobia. Centered on the role of individuals in shaping history, this class also reflects on the identity of Poles – citizens of a country located at the cross-roads of Eastern and Western Europe.

HIST 3122  Poland - Study Abroad  3 Credit Hours
This is an interdisciplinary course led in major Polish cities. The trip begins in Kraków, and then continues to Warsaw, Łódź, and Gdansk. While there, the class will explore various and often conflicting, aspects of Polish and Polish-Jewish history. Visits to these historical sites will be accompanied by appropriate primary and secondary source readings and documents. During the course of the trip, students are expected to actively participate in ten scheduled seminar meetings as well as numerous lectures and workshops with local historians. While on the trip, students will have the opportunity to experience Polish culture; traveling on local transportation, sleeping in local hostels and hotels and eating in local cafeterias and various eateries.

HIST 3125  Modern East-Central Europe  3 Credit Hours
This class offers introductory knowledge about the history of 19th and 20th century East-Central Europe – often called the lands-in-between – in particular Poland, Hungary, Czechoslovakia, and Romania. It helps us understand major European phenomena from the perspective of smaller European states. We will focus on important historical moments, ideologies, and concepts that formed the area and affected the local identities.
HIST 3130  Armenia Ancient Medieval World  3 Credit Hours
The course is a general survey of Armenian history and culture from the pre-historic period to the early sixteenth century, with emphasis on Armenia’s political, economic and cultural interrelationships with other countries and peoples in the Near and Middle East, Europe and Central Asia. The course analyzes how the major political and demographic shifts in world history impacted Armenia and the Armenians. Each era of Armenia history is discussed in terms of developments in the surrounding countries. Attention is given to politics, international relations, trade, religion, literature, art, and architecture.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3131  Armenia in the Soviet Period  3 Credit Hours
HIST 3131 will study the history of the Soviet Republic of Armenia, when it was ruled by Communists and was part of the USSR in 1920-1991. It will chronicle the broad political, economic, social and cultural developments throughout 70 years of Soviet history and will then study in detail how these developments affected life in Armenia, one of the fifteen union republics of the USSR, and relations between Armenia and the Armenian Diaspora outside the USSR, including the Armenian American community. The course will help students to better understand the Soviet experience by focusing on developments not only in the political center in Moscow, but in the southernmost and territorially the smallest of all the Soviet republics. It will also help students to better comprehend the historical background to some contemporary developments in Transcaucasia (the South Caucasus), Turkey, Iran and the Arab states of Western Asia.

HIST 3132  Armenians in the Modern World  3 Credit Hours
The course is a general survey of Armenian history and culture from the early sixteenth century to the present, with emphasis on political, economic and cultural interrelationships with other countries and peoples in the Near and Middle East, Europe and the Americas. The course analyzes how the major political shifts in world history impacted Armenia and the Armenians. Therefore, each era of Armenian history covered in this course is discussed in terms of developments worldwide and especially in the surrounding countries. Studying Armenia and the Armenian people gives students an understanding of what happens to, in, and around small countries as they find themselves in a regularly changing international political environment. Attention is given to politics, international relations, economics, religion, literature, art, and architecture. Modern Armenian history and culture is discussed in relation to Ottoman, Iranian, Russian, West European, North America, and other civilizations.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 314  England: Tudors and Stuarts  3 Credit Hours
A political, economic, and social survey of England from 1485 to the end of the 17th century. Focus is on the interrelation of society and politics as well as on the rise of England to major international status. (AY).

HIST 315  Modern Britain  3 Credit Hours
Course focuses on Great Britain from the time of the Industrial Revolution to the present. Major problems considered are industrialization, the British empire and its disintegration, the democratization of British political life, the creation of the welfare state, and Britain’s role in the contemporary world. (AY).

HIST 316  African American History  3 Credit Hours
This course traces the experience of African Americans from their first landing in Virginia in 1619 through slavery and the Civil War. Emphasis will be placed on the origins of racism, the development of the slave system in the United States and the historical developments that led to the Civil War. (YR).

HIST 318  Early American Republic  3 Credit Hours
This course examines the history of the United States from the ratification of the Federal Constitution through the Presidency of Andrew Jackson. Particular attention is given to the process of political party formation, the impact of the “market revolution” upon life, the origins and ramifications of the Second Great Awakening, the antebellum reform movements, and slavery. (YR).

HIST 319  Civil War & Reconstruction  3 Credit Hours
This course examines America’s pivotal middle period, a period of rising sectional tensions, bloody civil war, and protracted debate about the promise and limits of equality in the United States. Among the topics covered are the meaning of freedom in antebellum America, territorial expansion and the development of slavery as a political issue, the collapse of the national party system and the secession crisis, the meaning of the American Civil War, and the postwar settlement of reconstruction. (YR).

HIST 321  Late Imperial China  3 Credit Hours
Explores key issues in Chinese society and culture from around 900 CE to around 1800 CE, considering demography, family life and lineage organization, gender relations, farming and handicraft industries, intellectual trends, ethnic relations, popular culture, education, social stratification, and social control under imperial bureaucracy. (AY).

HIST 3211  Untold Caribbean: Field Course  3 Credit Hours
Full Course Title: Dark History and Untold Stories: Field Class in Caribbean Historical Archaeology. Field Class: involves international travel and required costs in addition to tuition. This class explores the story behind Caribbean "paradise." We use the analytical methods of historical archaeology to "read" sites of enslavement and resistance, as well as modern museum interpretations of Caribbean heritage, and engage in the production of new archaeological knowledge through excavation. We will ask how negative or "dark" history should be remembered, what life was like on Caribbean plantations, and how histories of slavery are relevant now. Throughout, we will examine how archaeology can tell the untold stories of the many people-black, white, free, and enslaved-who never made it into the history books. We will also contribute new voices with a "mini-field session" of archaeological excavation: students can gain a glimpse into scientific archaeology, and get to try out fieldwork to see if they would gain from a full field school. (S,OC)

HIST 322  Traditional China  3 Credit Hours
Examines Chinese history from ancient times to around 900 CE, stressing key developments in society, culture, and government that produced enduring cultural traditions, bureaucratic government, and distinctive patterns cultural exchange in Eastern Eurasia. (AY).

HIST 323  History of Modern China  3 Credit Hours
Studies China’s historical evolution from around 1800 to recent events in the People’s Republic; assesses China’s distinctive path to modernity from traditional ideals and patterns of order, including demographic transformations, Western impact, rebellions and wars, nationalism and revolutions, and recent economic growth and social change. (YR).
HIST 325  Traditional Japan  3 Credit Hours
Traditional Japan from ancient times to around 1800; emphasis is placed on the evolution of Japanese institutions under the cultural influences of China. (AY).

HIST 326  Modern Japan  3 Credit Hours
Japan from around 1850 to present. The course considers the impact of foreign contacts on the Tokugawa system, the emergence of Japan as a modern state, Westernization and nationalistic reaction, the rise of militarism, the Pacific War, economic growth and social changes after the war, and changes in the U.S.-Japan relations. (OC).

HIST 329  Medieval Society  3 Credit Hours
An analysis of social institutions and ideas from the High Middle Ages through the discussion of original sources. (AY).

HIST 330  The Renaissance  3 Credit Hours
This interdisciplinary study of Renaissance culture focuses on its preeminent center, Italy, in the 15th and 16th centuries. The course investigates major aspects of art, music, literature, and philosophy and their relationships to social, economic, and political structures.

HIST 331  The Reformation Era: 1500-1648  2 to 3 Credit Hours
A study of the nature, course, and impact of the Protestant Reformation in Europe, Humanism, the Counter-Reformation, and the cultural and social implications of Protestantism also receive attention. (YR).

HIST 333  Europe in Age of Rev:1750-1815  3 Credit Hours
History of Europe during a period when established patterns of thought, social structure, and institutions were violently challenged. (AY).

Prerequisite(s): HIST 365
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

HIST 334  Europe in Age of Imp:1815-1914  3 Credit Hours
Europe in the age of nationalism, industrialism, imperialism, and democracy; background and origins of World War I. (YR).

HIST 335  20th-Century Europe, 1890-1945  3 Credit Hours
Europe before, during, and after World War I; the rise of communism and fascism; World War II. (AY).

HIST 336  The Contmp World, 1945-Present  3 Credit Hours
The post-war world, U.S.-Soviet rivalry, European/Japanese renaissance, the Chinese Revolution; decolonization and the emergence of the Third World. (OC).

HIST 3368  Germany Since 1945  3 Credit Hours
This course covers the history of Germany since World War II. It examines 1) the postwar period and the legacy of Allied occupation; 2) the process by which Germany was divided and the period of its division, tracing the histories and divergent characters of East and West Germany; 3) the different ways in which both the Cold War context and the legacy of the Third Reich shaped the German experience of twentieth-century revolutions of society, culture, and sexuality; 4) Germany’s re-unification after 1989; and, finally, 5) the subsequent challenges in identifying a newly united but increasingly multicultural Germany’s place in a unified Europe, focusing on issues of immigration, national identity, and citizenship.

HIST 337  Islamic Movemnts Mid East Hist  3 Credit Hours
Will compare several Islamic movements in Middle Eastern history, starting with the rise of Islam in Mecca and Medina. Later impulses toward Islamic revival all looked back to the first movement, and hoped to capture both its spirit and its success. With this as background, the course will move to address two questions: How did later Islamic movements understand the history of the rise of Islam? How have later Islamic movements had to adapt their methods and their ideology to different historical circumstances? (AY).

HIST 338  Women&Islam Mid East to 1900  3 Credit Hours
This course covers the historical development of Islam’s normative stance towards women and gender roles in the Middle East from the rise of Islam to the earliest stirrings of feminist activism.

HIST 3380  The European City, 1750-2000  3 Credit Hours
As a novel form of social and spatial organization, the rise of the modern industrial city transformed the European landscape. This course tracks the growth and development of the city in modern Europe, focusing particularly on London, Paris and Berlin. The course considers the physical landscape of the industrial city and the infrastructural challenges of rapid urbanization, political revolution, the exercise of political power and social control in urban space, as well as intellectual and artistic responses to the urban environment. In the final two units of the course we consider 20th-century challenges to the model of urban modernity that has carried over from the nineteenth century, and which remains so powerful today.

HIST 3385  Sex, War, and Violence  3 Credit Hours
Full Title: Sex, War, and Violence: Gender and Sexuality in the 20th Century European History. This course centers the often overlooked role of gender and sexuality in the 20th century European mobilizations of state violence such as the Holocaust, Armenian Genocide, and conflicts in the former Yugoslavia. It emphasizes the clashes that occurred between gains in gender and sexual rights during the century and projects of state violence that were frequently aimed at dismantling these gains. Attention is paid to the intersection of race, class, religion and gender in the (re)construction of new gender and sexual hierarchies in conflict and post-conflict contexts in the region. (OC)

HIST 3387  Islamic Movemnts Mid East Hist  3 Credit Hours
Will compare several Islamic movements in Middle Eastern history, starting with the rise of Islam in Mecca and Medina. Later impulses toward Islamic revival all looked back to the first movement, and hoped to capture both its spirit and its success. With this as background, the course will move to address two questions: How did later Islamic movements understand the history of the rise of Islam? How have later Islamic movements had to adapt their methods and their ideology to different historical circumstances? (AY).

HIST 3389  Ottoman Empire in 19th Century  3 Credit Hours
The course is general survey of the history of the Ottoman Empire from the treaty of Kucuk Kaynarca in 1774 until the abolition of the caliphate in 1924. The course will examine such topics as modernization; imperialism; the rise of ethnic nationalism among the empire’s Christian and Muslim subjects; decocracy; ideologies like Ottomanism, pan-Islamism, Islamic modernism, and pan-Turkism; and changing ideas about gender.

HIST 3390  20th c European Women's Hist  3 Credit Hours
This course focuses on selected events on the 20th century that illustrate the defining experiences of women in both Western and Eastern Europe. These include women’s war experiences, women and 20th century ideologies (e.g., communism, nationalism, and fascism), women and the welfare state, and the state control of women’s bodies.

HIST 340  Freud’s Vienna: 1866-1920  3 Credit Hours
An analysis of the place of Vienna in the cultural history of the modern west; particular attention is given to the Vienna of Franz Josef (1848-1916) through the disciplines of history, art, architecture, music, literature, philosophy and psychoanalysis. Included are works by Freud, Schnitzler, Kraus, and Zweig. (AY).
HIST 341  Hist, Lit, & 20th Century Iran  3 Credit Hours
This course will examine the formation of modern Iranian culture through both historical documents and the creative works of mainly 20th Century Iranian poets and authors. The focus of the course will be the period between Iran's Constitutional Revolution of 1905-1906 and the revolution of 1977-1979.

HIST 343  Germany Before Hitler  3 Credit Hours
This course considers the history of Germany in the nineteenth and early twentieth centuries. Topics covered include the changing nature of German national identity, the creation and fall of the German Empire, German colonialism, immigration, World War I, and the Weimar Republic. We will also consider how trends in German politics and culture helped prepare the ways for Hitler's radical, racist version of German nationalism. (AR)

HIST 345  West Africa Since 1800  3 Credit Hours
A history of the West African peoples since 1800, which focuses on their unique cultural heritage. Themes include: West Africa before the advent of alien domination, the European Conquest, West Africa under the Colonial regimes, and the liquidation of colonial rule and the reassertion of West African independence. (AY).

HIST 349  Thomas Edison and his Era  3 Credit Hours
This course will introduce students to the life and work of Thomas Edison. Breaking with the stereotype of the lone inventor/genius, we will examine how Edison helped shape and was in turn shaped by the context of the Gilded Age America - when the United States emerged as an urban, industrial nation. Lectures and discussions will be supplemented by slides, films, and visits to the Edison-related sites at the Henry Ford. Throughout the course the following themes will be explored: invention and the labor process, the significance of manufacturing and marketing, and the origins of modern consumer culture. (OC).

HIST 3502  The Middle East 570 to 1800 CE  3 Credit Hours
This course covers the social and political history of the Middle East from the rise of Islam through several key transformations to 1800. We will examine the Middle East as the center of caliphal empires, as a place of political fragmentation, as a home to increasingly diverse ethnic and religious groups, as a region within an expanding Islamic world, and as the domain of the three so-called "gunpower empires" (the Ottoman, Safavid, and Mughal dynasties). (YR).
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40

HIST 3511  Modern Middle East, 1918-1945  3 Credit Hours
This course surveys the history of major political events and social changes in the Middle East from 1918 to 1945. Among the topics covered are the struggle of Arab States for independence, the rise of Kemalism, and the rise of the Pahlavi Dynasty.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3512  Modern Middle East, 1945-1991  3 Credit Hours
This course surveys the history of major political events and social changes in the Middle East from 1945 to 1991. Among the topics covered are the "Arab Cold War," the Palestinian-Israeli conflict, the struggle for democracy, and the resurgence of "Islamist" politics.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3520  Lebanon in Modern Middle East  3 Credit Hours
HIST 3520 studies the modern history of Lebanon and the country's involvement in broader Arab and Middle Eastern politics from the period when Lebanon's modern boundaries were established in 1920 to 2005 when Syrian troops were forced to leave the country. The course focuses on the relations of the Lebanese state, its various ethno-confessional communities and political groupings with the Great Powers like France, the United Kingdom, the Soviet Union and the United States of America, as well as with the influential Arab states in the region, in particular Egypt, Syria, Saudi Arabia and Iraq. Particular attention is paid to the impact of the Arab-Israeli conflict and the presence of Palestinian refugees on internal Lebanese politics. The course also analyzes the diverse, sometimes contrasting, visions among Lebanon's various local elites towards the country's place in the region and the world and how these visions underwent change in light of evolving internal social and external political developments. (YR)

HIST 354  The United States and Vietnam  3 Credit Hours
The Vietnam War was a major turning point in U.S. history. This course focuses on French rule in Indochina; U.S. interests in the region; U.S. involvement after 1945; the military, economic, and social nature of that intervention; and the consequences of the war. (OC).

HIST 355  Eng Colonies in Amer,1607-1763  3 Credit Hours
European expansion into North America; colonial societies, ideas, and institutions; imperial policy and administration, and accompanying changes in Amerindian and African cultures, and New World ecologies. (YR).

HIST 356  American Revolution, 1763-1815  3 Credit Hours
The causes, character, and consequences of the American Revolution, and the shaping of a new nation through the War of 1812. (YR).

HIST 358  Emerg of Modern U.S.,1876-1916  3 Credit Hours
An intensive study of the history of the United States from the end of Reconstruction to America's entry into World War I. Particular attention is paid to the social, economic, and intellectual aspects of the period and to the origins of 20th-century America. (OC).

HIST 359  Era of World Wars:1916-1946  3 Credit Hours
An intensive study of the history of the United States from 1916 to 1946. Topics include World War I and its aftermath, the Depression, the New Deal, World War II, and post-war settlements and problems. (AY).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280

HIST 360  The U.S. Since 1946  3 Credit Hours
This course focuses on the era bracketed by the Truman through the present administrations. Particular attention is given to the New Deal, the Truman policy of containment, the Cold War, relations with China, McCarthyism, the Korean war, the civil rights movements, the New Frontier, involvement in Vietnam, and the problems of contemporary America. (AY)

HIST 361  Michigan History  3 Credit Hours
This course covers some of the major trends and developments in the history of the state of Michigan from its aboriginal past to the present day. The course will focus upon placing the state's history within a broader national and international context and will focus upon such topics as aboriginal settlement and culture, colonization, American settlement and statehood, industrialization, immigration and political development. (YR)
HIST 3602  Comparat. American Identities  3 Credit Hours
This course will confront and complicate the following key questions: what does it mean to be an American? What is American culture? Participants in this course will respond to the questions central to the American Studies field by reading and discussing historical, sociological, literary, artistic, material culture, political, economic and other sources. Students will use this interdisciplinary study to examine the multiple identities of Americans - as determined by factors such as gender, race, class, ethnicity and religion. While emphasizing the diversity of American culture, participants will consider some core values and ideas uniting America both in historical and contemporary society. Students will be invited to seek out and share fresh narratives of the American experience. (OC).
Prerequisite(s): COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270 or COMP 280
Restriction(s):
Can enroll if Level is Undergraduate

HIST 361  United States Economic History  3 Credit Hours
A survey of the processes of development of the United States economy, their social implications, and the sources of today's economic problems. (F).
Prerequisite(s): ECON 201 and ECON 202

HIST 362  Eur and Intern'l Econ History  3 Credit Hours
A survey of the processes of industrialization in the major non-American industrial economies, with a focus on their relevance and implications. (AY).
Prerequisite(s): ECON 201 and ECON 202

HIST 363  Rel in Amer Hist:1607-1865  3 Credit Hours
A survey of the religious movements and trends in America from the 17th century to the Civil War, with emphasis on Puritanism, 18th-century revivalism, and 19th-century denominationalism and social reform. (AY).

HIST 3632  The US in the Middle East  3 Credit Hours
HIST 3632 will examine the involvement of the US in the Middle East from the late 18th Century to modern times. The relationship between domestic politics and foreign policy (both in the US and in the Middle East) will be examined as US involvement in the Middle East grows from irregular missionary and commercial activity in the 19th century, to the establishment full diplomatic relations, to the complexities related to the globalization of the oil industry, Cold War interventions and, ultimately, the establishment of US hegemony in the region. Students will examine a number of “case studies” in US-Middle East relations as a platform for their own research into other episodes of American involvement in the Middle East. (YR)

HIST 3634  History of Islam in the US  3 Credit Hours
This course traces the long history of Islam and of Muslims in the United States (1730s-present), paying careful attention to the interaction among Muslims across the dividing lines of race, gender, immigrant generations, sect, political orientation, and class, and between Muslims and other Americans.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior or Graduate

HIST 3635  The 1960s in America  3 Credit Hours
This course aims to interweave the civil rights movement, the Vietnam War, the student movements, the women’s movement, and other developments of the period to place them in an historical context of a complicated era of change. The course compels students to critically evaluate social movements, political developments, cultural trends, and foreign policies by close examination of primary documents as well as critical evaluations of the various ways that scholars have interpreted the period. (AY).

HIST 364  Rel in Am Hist II:1865-Present  3 Credit Hours
A survey of American religion from the Civil War to the present, with emphasis on ethnicity and religion and post-World War II revivals of religion. (AY).

HIST 3640  Black Intellectual History  3 Credit Hours
Full Course Title: Black Intellectual History. From Africa to the Diaspora
This course will bridge thinkers in Africa and the African Diaspora, i.e., North America, the Caribbean, and South America. It examines African and Diasporic intellectual movements from Ancient Egypt and Ethiopia to the present. Authors studied will include C.L.R. James, Frederick Douglass, Mary McLeod Bethune, Ida B. Wells-Barnett, Julius Nyerere, David Walker, Nelson Mandela, W.E.B. DuBois, Franz Fanon, Martin Luther King, Jr., and Cornel West. (YR)

HIST 3651  Women Leadership/Social Change  3 Credit Hours
The purpose of this seminar is to examine women's leadership in movements for social change. We will approach this topic through the study of historical examples, drawn primarily from the twentieth-century United States, and including movements for economic justice, race relations, sexual identity, peace, gender equality, public health, and social welfare. HIST 112 and WGST/ANTH/HUM/SOC/PSYC 303 recommended as prerequisites. (W)
Restriction(s):

HIST 3665  Automobile in American Life  3 Credit Hours
The course will explore a wide array of distinct, though interconnected, subjects such as: the manufacturing, engineering and design of the automobile and its relation to industrial and technological developments and consumer trends; the automobile’s role in America’s industrial growth and the impact that industrialization had upon American society; the automobile’s role in urbanization and urban sprawl; the mass marketing of the automobile and its connection to broader social constructions of class, race, and gender; the environmental impact of the automobile; and the automobile’s use and meaning as a cultural symbol and its relation to the American identity. Through the use of diverse mediums such as personal recollections, popular music, film, photographs, advertisements, automobile ephemera, literature, poetry and more traditional written sources the course will examine America’s ongoing fascination with the automobile. (OC)

HIST 3666  Henry Ford and His Place  3 Credit Hours
Using the biography of Henry Ford as a touchstone, the course will examine the trajectories of historical change and regional development between 1870 and 1950. Of fundamental concern will be southeastern Michigan’s transformation from a 19th century outpost on the Great Lakes to the nation’s “engine of change” in the 20th century. Henry Ford was the major player in that revolutionary transformation. This course examines his role in history and mythology as well as the causes and implications of that transformation. (OC).
HIST 3671 Intro to Arab American Studies 3 Credit Hours
This course explores the local, national, and global conditions through which Arab American identity and its alternatives take shape. It introduces students to humanities and social science approaches to the field of Arab American Studies.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

HIST 3672 Public Cultural Work 3 Credit Hours
Full Course Title: Public Cultural Work in Arab Detroit This course explores the field of public humanities work while providing a topical focus on metro-based Arab American history and culture. Roughly half of the course will be used to explore different approaches to public humanities work undertaken by scholars. The second half of the course will provide the historical and social context for understanding a particular research question to be examined jointly by the instructor, students, and a local cultural institution. Students will engage in intensive research and work with a cultural institution to represent their findings to the public. (OC)

HIST 3673 Arabs & Muslims in Media 3 Credit Hours
This course examines how perception of Arabs and Muslims took shape in the U.S. from the late nineteenth century through the present. Using historical developments as a conduit, we explore the treatment of Arabs and Muslims in news outlets, print media, film, and T.V. productions. For example, we analyze the motivation, plot construction, casting, and content of big budget Hollywood movies for patterns of stereotypes and representations/misrepresentations. (FAY)

HIST 3676 Arab Americans Since 1890 3 Credit Hours
This is a survey of immigration from the Arab Middle East from 1890 to the present. Readings from available scholarship, discussions, and reports facilitate exploring the Arabic-speaking immigrants’ early and recent experiences as art of U.S. society, including settlement, work, worship, military service, leisure, intellectual life, and primary and formal affiliations across the U.S.

HIST 368 Black Exp in US: 1865-Present 3 Credit Hours
The history of blacks in America is traced from the Reconstruction era and the rise of Jim Crow segregation to the Civil Rights movement of the 1960's and the current period. Special attention is paid to the migration of blacks to the north and the social-economic situation which they encountered there. Specific topics to be addressed include formation of the NAACP (YR).

HIST 369 Civil Rights Movement in Amer 3 Credit Hours
A survey of race relations and civil rights activity from the late 19th century to the present. The principal focus, however, is on the period since World War II, especially on the mass-based Southern civil rights movement (1955-1965) and the various policy debates and initiatives of the past thirty years, most notably affirmative action and busing. We also examine critiques of non-violence and integrationism. (AY).

HIST 3695 American City 3 Credit Hours
This course examines the development of urban America from the European-style port cities of the colonial period through the edge cities of today. The bulk of the course will focus on the late 19th and 20th century urban environment with an eye towards understanding the diverse residents, cultures, economies, and geographies that have shaped American cities. We will cover everything from developments in transportation, architecture, business, and technology to immigration, politics, and urban culture. Broad concerns and constituencies have shaped the urban public sphere, the physical development of cities and the experience of living as an urbanite and, consequently, they will receive much of our attention. American patterns of development will then be placed in context with those of other nations and cultures. (AY).

HIST 370 Women in Am-Hist Perspective 3 Credit Hours
A survey of women's role in American society from colonial times to the present, emphasizing both change and continuity in women's experience. (YR).

HIST 371 American Ideas, 1607-1865 3 Credit Hours
Ideas about God and humanity, nature and society, which constituted the spirit of the age from the 17th century to the Civil War. (OC).

HIST 3730 Bible in History 3 Credit Hours
In this course we will try to examine the historical circumstances and contexts surrounding the writing of The Hebrew Bible. Roughly speaking, we will begin by exploring three aspects of the subject: Historical context of the writing of the Bible i.e. during the organizing and communicating of each segment. History of the canonization: the ideas and rationale behind including some books but not others. History in the Bible. In more specific terms, this will entail examining who wrote the Bible, when and why. The narrative incorporates the movement from an oral tradition to a written one and will demand some focus on certain pivotal moments, e.g., Ezra’s reading (cf. Ezra-Nehemiah), or the historical events in Kings and Chronicles, or the defeat of the northern kingdom of Israel in 722 B.C.E. (BC) and of the southern kingdom of Judah in 589 B.C.E. (AY).

HIST 3735 Inside-Out Reading Prison Narr 3 Credit Hours
Full Title: Inside-Out Prison Exchange: Reading Camp and Prison Narratives The course invites students to reflect on various prison narratives from select European countries. We will investigate how men and women of different races and ethnicities experienced oppression and how they used their bodies and developed skills to remain human in dehumanizing conditions. This provides students with an opportunity to reflect on the circumstances that led to their imprisonment, but also with a way to examine how they narrated their life stories. While doing the course will examine the concept of agency as something that frames life stories. Finally, it will allow students to reflect on various ways individuals in various circumstances struggle to remake their lives inside as well as outside of prison. Various categories, such as gender, art, resistance, body and space will help us navigate through rich primary source material, which includes memoirs, drawings, paintings, and poems created within a constrained space of prisons and camps. The course is part of the Inside-Out Prison Exchange Program, which combines a theoretical knowledge with practical understanding and experience by holding class inside Macomb Correctional Facility throughout the semester. The class has roughly equal numbers of UMD students and incarcerated students, and utilizes a variety of active learning techniques, leading to the production of one or more class projects by the end of the course.
HIST 374  History of Industrial Technology  3 Credit Hours
Focusing on western Europe and the United States since the Industrial Revolution, this course will examine the history of manufacturing technologies and will include the following topics: mechanization and the rise of the factory; mass production; the process of innovation; design and diffusion of new technologies; technologies; technology and the changing nature of work; automation and lean production systems. Through readings, class discussions, and examination of artifacts (actual tools and machines), students will consider the central role played by technology in the making of modern society. (OC).

HIST 375  Heterodox Economics  3 Credit Hours
This course introduces students to alternative perspectives on economic theory and method. These alternatives include: Marxian and radical political economics, institutional and evolutionary economics, behavioral economics, post-Keynesian economics and feminist economics. (OC).

Prerequisite(s): ECON 201 and ECON 202

HIST 3750  Modern Warfare  3 Credit Hours
A chronological overview of the major military conflicts occurring between 1775 and 2001, with an emphasis on the technological, political, international and social changes that shaped the course of modern warfare. Designed to explore the connections between "total war," the rise of mass society and the relationship between modern warfare, revolution and decolonization.

HIST 378  History of Consciousness  3 Credit Hours
Traces changes in the way people have viewed themselves, the world and changes in the forms or orders of thinking; in other words, changes in consciousness and concepts of the unconscious. The mode is intellectual history and involves studies of the ideas of philosophers, psychologists and literary artists. The class will examine ancient and "primitive" consciousness as well as forms of society. (AY).

HIST 379  Language, Myth & Dreams  3 Credit Hours
An examination of the relationships between language, myth, dreams, and thinking processes; considers the work of such scholars as Ernst Cassirer, Noam Chomsky, and Freud; studies the nature of the mind from philosophical, psychological and literary perspectives. (AY).

HIST 381  Intell Hist of Modern Europe  3 Credit Hours
An examination of the intellectual currents from the scientific revolution, the Enlightenment, the currents of 19th and 20th century thought including romanticism, conservatism, liberalism, socialism, Darwinism. Includes analysis of the reactions to World War I, the Russian Revolution, and World War II. Readings include works by Descartes, Rousseau, Marx, Darwin, Zola, Freud, Kafka and Koestler. (AY).

HIST 383  Labor in America  3 Credit Hours
A survey of urban workers from colonial times to the present. Among the topics covered are changing standards of living, the experiences of industrial work, labor organization, and working-class politics. (YR).

HIST 384  Immigration in America  3 Credit Hours
A survey of the "immigrant experience" in the United States, from the early 19th century to the present. Particular attention is given to enduring problems of economic adjustment and cultural assimilation, and to the impact of immigration on the host society. (AY).

HIST 385  Modern France  3 Credit Hours
A history of France from the French Revolution to the present. The major emphasis is on the political evolution of France with some attention to social and economic development. (AY).

HIST 386  Compar History of Technology  3 Credit Hours
This course will examine the history of technology from a comparative perspective: studying the development and impact of technology in different societies during various historical eras. Topics include: irrigation control and the rise of ancient empires; technology's role in the industrial revolution; technological innovation and the pace of social change. Current issues and various analytical perspectives in the history of technology will also be examined. (OC).

HIST 387  Aspects of the Holocaust  3 Credit Hours
A survey of how and why millions of Jews, Gypsies, Slavs, and political and "racial" enemies of the Reich were so quickly and determinedly slaughtered. (YR).

HIST 389  Nazi Germany  3 Credit Hours
History of National Socialism, its goals and structure. Also addressed are the nature of the dictatorship; the role of the historian in interpreting the era and the use and evaluation of historical documents. (YR).

HIST 390  Topics in History  3 Credit Hours
Problems and issues in selected areas of history. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when specific topics differ. (OC).

HIST 390D  Topics in History  3 Credit Hours
TOPIC TITLE: State, Culture and Society in Modern Iran. For Iranian specialist, these are exciting times. There is a new wave of interdisciplinary research on Iran coinciding with a surge of political and intellectual debate about the direction of contemporary Iranian society. Honors students will capitalize on this in the tutorial by examining Iranian history and society from a number of interrelated standpoints: historical, legal, literary, anthropological and cinematic. We will cover the following topics: the rise of the modern state in Iran (from sacral kingship to the Islamic Republic), Twelver Shi'a Islam in Iran (including the rise of modern clergy and heretical off-shoots), Islamic revivalism in Iran (Ali-Afghani, Khomeini and the Islamic-Marxist, Ali Shariati and reformist Abd al-Karim Sorush), modern Persian prose (Jamalzadeh, Daneshvar, Chubak and Al-e Ahmad), America and Iran and economy and society in Iran (oil industry, urbanization and mass media culture). These topics will be explored through a combination of research monographs, translated literary or historical material (e.g., both of Iran's constitutions) and films. Students will read, discuss and write on the following text: The Mantle of the Prophet by Roy Mottahedeh and The Daughters of Qucan by Afsaneh Najmabadi (history), The Children of Deh Kor by Erika Friedl and Law of Desire by Shahla Haeri (anthropology), Persian is Sugar by Mohammad Ali Jamalzadeh, Savushun by Simin Daneshvar, The Patient Stone by Sadeq Chuba (fiction), and Weststruckness by Jalal Al-e Ahmad (social criticism).

HIST 390E  Topics in History  3 Credit Hours
TOPIC TITLE: Reconstructing Historical Memory: The Second World War and the America Cinema.

HIST 390F  Topics in History  3 Credit Hours
TOPIC TITLE: The Mantle of the Prophet by Roy Mottahedeh and The Daughters of Qucan by Afsaneh Najmabadi (history), The Children of Deh Kor by Erika Friedl and Law of Desire by Shahla Haeri (anthropology), Persian is Sugar by Mohammad Ali Jamalzadeh, Savushun by Simin Daneshvar, The Patient Stone by Sadeq Chuba (fiction), and Weststruckness by Jalal Al-e Ahmad (social criticism).

HIST 390O  Topics in History  3 Credit Hours
TOPIC TITLE: Reconstructing Historical Memory: The Second World War and the America Cinema.

Prerequisite(s): HIST 365 and HIST 261 and HIST 262 and HIST 263
Restriction(s): Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate
HIST 3900  Topics in History  3 Credit Hours
Topic: The Native American Past. This course introduces students to the long and rich history of America's First Peoples from earliest times to the present. Although the topics covered in class will be wide-ranging, the course emphasizes certain unifying themes: the diversity of indigenous peoples and cultures; the agency of First Peoples; the political, economic, and cultural dimensions of European/Indian accommodation and resistance; the evolution of government Indian polices and Native American responses to them; and contemporary issues confronting native peoples. The course examines the Native American Past from native people's perspectives, by including the unfamiliar voices of those peoples in more familiar accounts of America's past, and by introducing students to ways of studying neglected parts of the past and to some of the varied ways that historians (both Native and non-Native) have interpreted the Native American past.

HIST 391  Topics in History  3 Credit Hours
Examination of problems and issues in selected areas of history. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

HIST 398  Independent Studies in History  1 to 3 Credit Hours
Readings or analytical assignments in history in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. (OC).

HIST 399  Independent Studies in History  1 to 3 Credit Hours
Readings or analytical assignments in history in accordance with the needs and interests of those enrolled as agreed upon by the student and instructor. (F,W).

HIST 4312  European Encounters, 1400-1800  3 Credit Hours
During the early modern period, merchants, explorers and travelers set out from the European West in unprecedented voyages of discovery, intensifying interaction between cultures and initiating contact with previously unknown civilizations. In this advanced seminar we examine original documents (in English) as well as current scholarship about encounters between groups of Europeans and inhabitants of other parts of the world from the perspective of both sides. Comparing these contradictory (and often incompatible) accounts of the same events, provides a more comprehensive understanding of the process of European expansion, and of the strengths (and limitations) of historical sources. Additional assignments will distinguish the undergraduate and graduate versions of this course.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Arts, Sciences, and Letters

HIST 4401  Seminar: African Diaspora  3 Credit Hours
Research seminar on the history of the African Diaspora in the Atlantic World. This course covers examples of classic texts in the field, as well as significant new scholarship, with an emphasis on critical reading, analysis, and the development of an independent research project. Students gain a deeper understanding of the significance of the African Diaspora in the New World, derived from lectures and discussions providing an overview of this subject, as well as the micro views gleaned from sharing classroom presentation about students' individual research topics. The graduate version of this course includes weightier readings and assignments, with a research paper for potential publication.
Prerequisite(s): HIST 300 or AAAS 275 or HIST 345 or AAAS 345
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Graduate

HIST 4505  Feminism & Mod. Mid. East  3 Credit Hours
This course provides an analysis of the history, historiography, and sources for the study of feminism in the Middle East since 1800. 
Prerequisite(s): COMP 106 or HIST 101 or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 4515  Culture& Hist. in Mod. Iran  3 Credit Hours
Alongside the most influential academic studies of Iran, this course uses cultural sources (such as literature and film) as windows on the pivotal social and political movements in Iranian history since 1800. This study of cultural change factors in cultural debates inside Iran, the growth of the Iranian Diaspora, and the increased presence of Iranian culture in electronic media. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Prerequisite(s): (HIST 101 or HIST 103) and (COMP 106 or COMP 220 or COMP 270 or COMP 280) and (HIST 337 or HIST 338 or HIST 339 or HIST 3130 or HIST 3132 or HIST 3502 or HIST 3511 or HIST 3512 or HIST 3520 or HIST 3632 or HIST 4505 or AAST 300 or ANTH 373 or ARBC 301 or ARBC 302 or ARBC 305 or ARBC 331 or ARBC 332 or ARBC 350 or ARBC 351 or ARBC 390 or ARTH 384 or ARTH 385 or COMM 430 or ECON 444 or GLOC 301 or PHIL 306 or POL 385) or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 4600  U.S. Cultural History  3 Credit Hours
The seminar concentrates on scholarly interpretations of U.S. history through a cultural lens. It features close analysis of classic texts in American cultural history as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the cultural aspect of U.S. history and a familiarity with this mode of analysis, its guiding theories, newest trajectories and scholarly debates, and impact on the field of history as a whole. Additional assignments will distinguish the undergraduate and graduate versions of this course. Cannot receive credit for both HIST 490A and HIST 4600.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 465  The Family in History  3 Credit Hours
An analysis of the emergence of the modern family from the 16th century to the present with focus on the history of childrearing, family size and structure, intra-familial and inter-generational relationships and population patterns. (OC).

HIST 4650  Sem in US Women's History  3 Credit Hours
Seminar on the historiography and key primary sources related to U.S. Women's History. The course covers examples of classic texts in the field as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the field, its guiding concepts, foundational texts, newest trajectories, and impact on the field of history as a whole. The graduate version of this course includes weightier readings and assignments.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
HIST 4677  Arab American Identities  3 Credit Hours
Extensive discussions and critical analysis of the main markers of Arab American identity formation from late nineteenth century to present. This seminar provides in-depth assessments of immigrant narratives from various sources and disciplinary approaches on specific racial, ethnic, and gender experiences within the larger U.S. context. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Level is Undergraduate

HIST 4678  Middle Eastern Diasporas  3 Credit Hours
This course explores the diasporas of Arabs, Turks, Assyrians, and Iranians living in Europe and the Americas that have occurred since the 1880s. It pays careful attention to how "aspects of diaspora" shape, mimic, transect, and undermine the political and economic regimes of which they are part. The reception of Middle Eastern communities in different national contexts and historical periods receive special attention as do their adaptive strategies as religious, ethnic, gendered, and racialized minorities. Those enrolled in the graduate level of the course pursue additional readings and assignments.
Prerequisite(s): AAST 3150 or HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HIST 4690  Borderlands History  3 Credit Hours
In this advanced reading seminar, students explore major themes and historiographical approaches to the study of borderlands history. Borderlands history is a growing historical field that focuses on interactions of peoples and empires across present day national boundaries. Borderlands history is a historical approach that originated among historians of the United States, so a majority of our readings focus on North America. Many of the insights of the U.S. borderlands history, however, have influenced historians of borderlands regions worldwide, and so we also read borderlands histories focusing on other regions of the world, particularly China and Central Eurasia.
Prerequisite(s): HIST 300

HIST 490  Sel Topics Seminar in History  3 Credit Hours
Examination of problems and issues in selected areas of history. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when specific topics differ. Primarily, but not exclusively, for undergraduate history concentrators. Students are introduced to current issues in the area of historical research and learn how to appreciate selected writings, which represent the best of recent scholarship. (OC).
Prerequisite(s): HIST 300

HIST 497H  History Seminar  3 Credit Hours
This course is unlike other courses offered by the history discipline in that its primary function is to introduce students to the process of intensive historical inquiry with its end being the production of a high-quality, original research paper. As a seminar, it is intended for advanced concentrators who will research their own specialized topics within the intellectual community of the seminar?providing support and enrichment for the other class members. The general theme for the semester is ?Microhistory.? Within this general rubric we will be focusing upon three major issues: 1) Microhistory as a tool of historical investigation/ analysis [i.e., what is microhistory?], 2) the advantages/disadvantages of this approach to historical inquiry [what can it reveal for us?], and 3) employing the technique to produce a discrete microhistorical study [how do we do it?]. The overall purpose of this micro-level approach is to provide a distinct, readily accessible medium through which to consider broader historical trends.

HIST 498  Senior Honors Thesis  3 Credit Hours
Two successive semesters of independent work on a major research paper under the direction of a member of the discipline and the program coordinator. (F,W).
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if Major is History

HIST 499  Advanced Ind Studies in Hist  1 to 4 Credit Hours
Readings and analytical writing in history, in accordance with the interests of the student and approval of the instructor. Students must submit a written proposal of study for approval. (OC).
Restriction(s):
Can enroll if Level is Undergraduate

HIST 4999  Senior Research Seminar  3 Credit Hours
This seminar is required for the completion of an undergraduate degree in history. Students will develop an independent research paper that is well-grounded in the appropriate academic literature and using advanced research methodology. History concentrators may not use credit for both this course and HIST 497 or HIST 498 to meet their capstone requirement.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is History

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Individual Program of Study
The Individual Program of Study (IPS) is an option for first year students at UM-Dearborn under the new Dearborn Discovery Core general education requirements. The Individual Program may not duplicate an already existing major in the College of Arts, Sciences, and Letters and it is recommended that an interdisciplinary curriculum, in the true spirit of a Liberal Arts education, be created.

• Example 1: German Studies; language and culture, as well as the history of German speaking countries. An interdisciplinary major could be created including course work in language, philosophy,
history, art history, music history, global studies and environmental science at the 300 and above level.

- **Example 2:** Middle Eastern History; Arabic culture and literature as well as early civilization history courses. An interdisciplinary major could be created including course work in Islamic Art History and Philosophy, along with Middle East Economics and Political Science at the 300 and above level.

After completing 30 hours at UM-Dearborn with a 3.25 or higher GPA, a rising sophomore would seek out a Professor on a tenure track faculty appointment to propose their individual major idea. Anyone interested should plan to write up the proposal before meeting with the possible faculty advisor, or if meetings have already occurred, frame the discussions that have occurred in the written proposal with a possible title.

**Approval requires:**

- A title
- A formal program of study, unlike any other taught in the College
- The student rationale
- The faculty rationale
- A proposed regular advising schedule so student and faculty member will remain in regular communication

Once written up, the proposal must move to the Department Executive Committees from which curriculum has been pulled for approval. Followed by approval from the IPS Committee and UCDC.

For more information, contact CASL Advising and Academic Success: room 1039 CB; casladvising@umich.edu or 313-593-5293.

**Integrated Science**

The Bachelor of Science in Integrated Science is a degree designed for students seeking to teach science in high schools. The sixty credit hour degree meets the State of Michigan’s requirements for 12 credit hours each in Biology, Chemistry, Earth Science and Physics. An additional 12 credit hours in any one of these areas provides the required minor in science. Students successful completing this program and passing the Michigan Test for Teacher Certification in Integrated Science (secondary) will meet the standards for the ‘highly qualified’ designation. This degree is only for those students who are also seeking a certificate in secondary education from the College of Education, Health, and Human Services. It is also a degree intended for students who wish to teach in smaller school districts. Students seeking employment in large districts should consider majoring in Biology, Chemistry, Earth Science or Physics and minoring in another of these 4 areas.

The degree requires that certain courses in each of the four areas be taken. The remaining hours will consist of electives from the list of courses below. Other courses may be possible. Students should consult with their advisor about course selection. In addition to regularly offered

- **Foreign Language Requirement**
  Complete a two-semester beginning language sequence.
  - Ancient Greek I and II MCL 105 and MCL 106
  - Arabic I and II ARBC 101 and ARBC 102
  - Armenian I and II MCL 111 and MCL 112
  - Chinese I and II CHIN 101 and CHIN 102
  - French I and II FREN 101 and FREN 102
  - German I and II GER 101 and GER 102
  - Latin I and II LAT 101 and LAT 102
  - Spanish I and II SPAN 101 and SPAN 102

- **Major Requirements**
  A minimum of 24 hours of 300 level or above course work is required. Keep in mind the title will go on the official transcript at graduation. If the proposed faculty advisor is an Assistant Professor, an Associate or Full Professor must also be brought into the plan before approval will be granted.

  - **Degree Programs**
    - Biology
    - Chemistry
    - Earth Science
    - Physics

  - **Course Requirements**
    - Lecture/Lab Science Course
    - Additional Science Course

  - **Example 1**:
    - Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)
    - Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

  - **Capstone**
    Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

  - **Foundational Studies**
    Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)
    - Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
    - Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

  - **Areas of Inquiry**
    Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
    - **Arts and Humanities**
      - Lecture/Lab Science Course
      - Additional Science Course
courses in Natural Sciences, students must also elect at least one of the NSCI 331, NSCI 332 or NSCI 333 courses. These latter courses will also count towards the 12 hrs for the minor.

Students will need to consult with advisors in the College of Education, Health, and Human Services in order to meet the certification requirements (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/undergraduate-degree-programs/secondary-grades-6-12-certification/) for teaching in secondary schools.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

### Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

### Areas of Inquiry

Natural Science (GENS) – 7 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

### Capstone

Capstone (GECE) – 3 Credits [Link](http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

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**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

- Ancient Greek I and II: MCL 105 and MCL 106
- Arabic I and II: ARBC 101 and ARBC 102
- Armenian I and II: MCL 111 and MCL 112
- Chinese I and II: CHIN 101 and CHIN 102
- French I and II: FREN 101 and FREN 102
- German I and II: GER 101 and GER 102
- Latin I and II: LAT 101 and LAT 102
- Spanish I and II: SPAN 101 and SPAN 102

### Major Requirements

#### Code | Title | Credit Hours
--- | --- | ---

**Integrated Science Core**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one or more courses from the list below to complete 12 hours:

- BIOL 301 | Cell Biology | 4
- BIOL/ESCI 304 | Ecology | 4
- BIOL 306 | General Genetics | 4
- BIOL/ESCI 320 | Field Biology | 4
- BIOL 324 | Invertebrate Zoology | 4
- BIOL 333 | Plant Biology | 4
- BIOL/MICR 385 | Microbiology | 4
- BIOL 419 | Behavior and Evolution | 4
- NSCI 333 | Inquiry: PBL in Life Science | 1

**Chemistry**

- CHEM 134 | General Chemistry I | 4
- or CHEM 144 | Gen Chemistry IB | 4
- CHEM 136 | General Chemistry IIA | 4
- or CHEM 146 | General Chemistry IIB | 4
- CHEM 225 | Organic Chemistry | 3

Select one or more courses from the list below to complete 12 hours:

- CHEM 226 | Organic Chemistry II | 2
- CHEM 227 | Organic Chemistry Laboratory | 2
- CHEM 303 | Inorganic Chemistry I | 2
- CHEM 344 | Quantitative Analysis | 2
- NSCI 331 | Phy. Sci. & Everyday Thinking | 1,2

**Earth Science**

- GEOL 118 | Physical Geology | 4
- GEOG/ENST 203 | Weather and Climate | 3
- ASTR 130 | Introduction to Astronomy | 3
- ASTR 131 | Introductory Astronomy Lab | 1

Select one or more courses from the list below to complete 12 hours:

- GEOG/ENST 310/STS 309 | Economic Geography | 1
- GEOL 218 | Historical Geology | 1
- GEOL/ESCI/GEOG 305 | Intro to GIS | 1
### Integrative Studies

Integrative Studies at UM-Dearborn is intended for students who wish to customize their degree program to fit their own interests and aspirations. Students create their own curriculum path, choosing three individual concentrations, or minors, instead of a traditional major. Students may further customize their degree by enrolling in internships or cooperative education. All students must complete a minimum of 39 credit hours for the Integrative Studies major, which includes LIBS 450 Capstone.

Integrative Studies leads to an interdisciplinary Bachelor of Arts or Bachelor of Science degree, depending on the concentrations selected. Aside from giving students the opportunity to build an individualized program suited to their own personal and/or career goals, Integrative Studies can also provide an excellent foundation for graduate and professional education in many areas, including law, business, public administration, counseling, and social work.

### More about Integrative Studies

Integrative Studies includes all the academic minors (which become concentrations for this major)—interdisciplinary as well as disciplinary—in CASL, plus the programs in the College of Business; College of Education, Health and Human Services (excluding teacher certification minors); and Computer and Information Science from the College of Engineering and Computer Science. An advisory committee of faculty and staff oversees the program. See an academic advisor in CASL Advising and Academic Success, 1039 CB, for additional information about this major.

- Students transferring from a community college with an Associate Degree may transfer a maximum of 30 credit hours of general credit courses (GENL).
- The Foreign Language requirement not needed for this major.
- LIBS 450 Capstone is required.

For more information, contact CASL Advising and Academic Success: room 1039 CB; casladvising@umich.edu or 313-593-5293.

### Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

### Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

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#### Notes:

1. At least one course from NSCI 331, NSCI 332, or NSCI 333 must be elected.
2. The credits for NSCI 331 can be attributed to both Chemistry and Physics.
3. Any upper division courses accepted for credit towards a degree in the area will meet this requirement.
4. Students choosing Biology must include at least one course from each of the following categories: Cellular and Molecular (CACM); Organismal (CAOB); Population and Environmental (CAPE). See Degree Works for list of courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL/ENST 340</td>
<td>Remote Sensing</td>
</tr>
<tr>
<td>GEOL 342</td>
<td>Physical Oceanography</td>
</tr>
<tr>
<td>GEOL/ESCI 370</td>
<td>Environmental Geology</td>
</tr>
<tr>
<td>GEOL/ESCI 372</td>
<td>Energy Resources</td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
</tr>
<tr>
<td>NSCI 332</td>
<td>Inquiry: Mich Earth Science ¹</td>
</tr>
</tbody>
</table>

**Physics:**

- **PHYS 125** Introductory Physics I
- or **PHYS 150** General Physics I

- **PHYS 126** Introductory Physics II
- or **PHYS 151** General Physics II

Select one or more courses from the list below to complete 12 hours: 3-4 credits

- **PHYS 305** Contemporary Physics
- **PHYS 360** Instrumentation for Scientists
- **PHYS 401** Mechanics
- **PHYS 403** Electricity and Magnetism
- **PHYS 405** Optics
- **PHYS 406** Thermal and Statistical Physic
- **NSCI 331** Phy. Sci. & Everyday Thinking ¹²

**Concentration in one of the Four Areas Above: Biology; Chemistry; Earth Science; Physics. ⁴**

Students will select 12 additional upper level credit hours in one of the four areas listed above. ³

**Total Credit Hours** 60-63

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#### General Education Program:

Areas of Inquiry

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Major Requirements

Integrative Studies students must select three concentrations. Concentrations are divided into three groups:

• **Group I—CASL Concentrations**

  12 credit hours at the upper level required (plus prerequisites as needed) in each concentration chosen. You may choose one, two, or all three concentrations from Group I.

  Anthropology (p. 290), Applied Statistics (p. 298), Arabic (p. 301), Art History (p. 305), Biochemistry (p. 317), Biological Sciences (p. 321), Chemistry (p. 329), Comparative Literature (p. 340), Computer and Computational Mathematics (p. 342), Economics (p. 353), English (p. 358), Environmental Science (p. 368), French Studies (p. 377), Geology (p. 383), German (p. 385), Hispanic Studies (p. 392), History (p. 396), Humanities (http://catalog.umd.umich.edu/undergraduate/college-arts-sciences-letters/humanities/#minortext), Linguistics (p. 425), Mathematics (p. 429), Microbiology (p. 438) Music (p. 441), Philosophy (p. 450), Physics (p. 455), Political Science (p. 460), Psychology (p. 466), Sociology (p. 483)

• **Group II—CASL Concentrations**

  12-18 credit hours required at the upper level (plus prerequisites as needed) in each concentration chosen. Most concentrations in Group II have specific courses required. You may choose one, two, or all three concentrations from Group II.

  African and African American Studies (p. 284), Applied Art (p. 295), Arab American Studies (p. 300), Astronomy (p. 310), Communications (p. 336), Community Change Studies (p. 340), Criminology and Criminal Justice (p. 345), Environmental Studies (p. 373), Film Studies (p. 375), Geography (p. 380), Global Cultures (p. 387), Journalism and Screen Studies (p. 418), Law and Society (p. 423), Leadership & Communication in Organizations (p. 424), Medieval and Renaissance Studies (p. 436), Organizational Change in a Global Environment (p. 442), Religious Studies (p. 472), Science and Technology Studies (p. 475), Social Science Research Methodology (p. 478), Society and Technological Change (p. 480), Urban and Regional Studies (p. 491), Women’s and Gender Studies (p. 495).

• **Group III—Concentrations Outside of CASL**

  You may choose only one concentration from Group III. Each area requires a minimum of 15 credit hours at the upper level (plus prerequisites as needed). See a CASL academic advisor for details.

  Accounting (p. 508), Computer and Information Science (p. 616), Digital Marketing (p. 513), Entrepreneurship (p. 513), Finance (p. 515), Financial Planning (p. 518), Health Policy Studies (p. 564), Human Resources Management (p. 520), Information Systems Security (p. 525), Information Systems Management (p. 522), Management (p. 525), Marketing (p. 526), Public Health (p. 572), Social Work (p. 596), Supply Chain Management (p. 530).

  **Capstone Course** - all students must complete LIBS 450

### International Studies

The Bachelor of Arts in International Studies combines foreign language and cultural studies with a thorough grounding in a professional area such as business and management, economics, computer information science, communication, or political science. The major is designed to prepare students for careers in international relations and business or other fields with an international dimension.

The major consists of three components at the upper level:

I. **Foreign Language and Cultural Concentration** (18 credit hours upper level plus lower level prerequisites) devoted to foreign language, culture, and civilization (including optional study abroad). Languages: Arabic, French, German, Spanish.

II. **Professional Concentration** (generally 15 credit hours upper level plus lower level prerequisites) devoted to the basic skills of art administration (museum studies), business and management, communications, computer and information science, economics, engineering, environmental studies, history, journalism and screen studies, natural sciences, or political science (international affairs).

III. **Cognates** (9 credit hours upper level) devoted to studies (and optional internship experiences) which will provide the larger international context and additional useful skills to coordinate the subjects of Concentrations I and II.

This program is also eminently suitable as a second major for students who want to add a strong international component to their major field of interest. In this case, courses taken for their first major may also fulfill "Professional Concentration" requirements in International Studies; e.g., students majoring in art history, business and management, communications, computer information science, economics, engineering, environmental studies, history, natural sciences, or political science (international affairs) can add International Studies as a second major by fulfilling requirements of Concentration I (Foreign Languages and Culture).
and III (Cognates) and counting their first major as Concentration II (Professional).

**Advising**

International Studies majors are urged to consult with a faculty mentor in the foreign languages and the other professional areas before the beginning of each semester.

Students with a high school background of three to four years study of Arabic, French, German or Spanish would be able to begin their studies of the same foreign language at UM-Dearborn with the 201, 202, or even 301 foreign language class. The curriculum for such students would be more flexible than that previously described. Students with a high school foreign language background would have an additional 8-11 hours for electives in areas of their special interests.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient Greek I and II</td>
<td></td>
</tr>
<tr>
<td>Arabic I and II</td>
<td></td>
</tr>
<tr>
<td>Armenian I and II</td>
<td></td>
</tr>
<tr>
<td>Chinese I and II</td>
<td></td>
</tr>
<tr>
<td>French I and II</td>
<td></td>
</tr>
<tr>
<td>German I and II</td>
<td></td>
</tr>
<tr>
<td>Latin I and II</td>
<td></td>
</tr>
<tr>
<td>Spanish I and II</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCL 105 and MCL 106</td>
<td></td>
</tr>
<tr>
<td>ARBC 101 and ARBC 102</td>
<td></td>
</tr>
<tr>
<td>MCL 111 and MCL 112</td>
<td></td>
</tr>
<tr>
<td>CHIN 101 and CHIN 102</td>
<td></td>
</tr>
<tr>
<td>FREN 101 and FREN 102</td>
<td></td>
</tr>
<tr>
<td>GER 101 and GER 102</td>
<td></td>
</tr>
<tr>
<td>LAT 101 and LAT 102</td>
<td></td>
</tr>
<tr>
<td>SPAN 101 and SPAN 102</td>
<td></td>
</tr>
</tbody>
</table>

**Major Requirements**

**Concentration I. Foreign Language and Culture**

(Select one language: Arabic, French, German or Spanish)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Major Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourth-semester proficiency (202 level) or equivalent in Arabic, French, German or Spanish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Required courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language 301 Advanced Conversation and Composition I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Language 302 Advanced Conversation and Composition II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Twelve credits of additional upper-level courses in the chosen language</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

A literature course in the chosen language is highly encouraged.

**Notes**

Students are encouraged to spend a semester or year in one of the many approved study-abroad programs.

Students who wish to study two foreign languages within the framework of the International Studies Program should see the International Studies Director to design an acceptable balanced curriculum.

Normally students will not be permitted to count the Humanities Internship (HUM 485) as a part of the concentration requirements. They are encouraged to elect an internship as part of their Cognates.

**Concentration II. Professional Studies**

Select one

**Option A. Business and Management**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
</tbody>
</table>

| Prerequisites | |
|---------------|---|---|
| ACC 298       | Financial Accounting | 3 |
| ECON 201      | Prin: Macroeconomics  | 3 |
| ECON 202      | Prin: Microeconomics  | 3 |
| ISM 310       | Info Systems in Management | 3 |

Students are encouraged to elect an internship as part of their Cognates.
MATH 104  College Algebra  4
  or MATH 105  Pre-Calculus

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two courses from (CAIB):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 330</td>
<td>Managerial Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 400</td>
<td>Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>COMM 340</td>
<td>Professional Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 430</td>
<td>International Communications</td>
<td>3</td>
</tr>
<tr>
<td>IB 486</td>
<td>Seminar: International Bus</td>
<td>3</td>
</tr>
<tr>
<td>MKT 457</td>
<td>Glbl Mrktng&amp;Consumr Cultre</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours  31

**Option B. Computer and Information Science**

**Code**  | **Title**                                | **Credit** |
|----------|------------------------------------------|------------|

**Prerequisites**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>CIS/CCM 150</td>
<td>Computer Science I</td>
<td>3</td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 350</td>
<td>Data Struc and Algorithm Anlys</td>
<td>4</td>
</tr>
</tbody>
</table>

Select three additional CIS upper-level courses (300-level or above excluding CIS 399 and CIS 499)

Total Credit Hours  32

**Option C. Economics**

**Code**  | **Title**                                | **Credit** |
|----------|------------------------------------------|------------|

**Prerequisites**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 104</td>
<td>College Algebra ¹</td>
<td>3</td>
</tr>
</tbody>
</table>
  or MATH 105  Pre-Calculus

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 447</td>
<td>International Finance</td>
<td>3</td>
</tr>
<tr>
<td>ECON 448</td>
<td>International Trade</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one additional course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON/HIST 362</td>
<td>Eur and Intl Economic Hist</td>
<td>3</td>
</tr>
<tr>
<td>ECON 442</td>
<td>Economic Development</td>
<td>3</td>
</tr>
<tr>
<td>ECON 444</td>
<td>Economies of the Middle East</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two additional courses from the following (CAIE):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 301</td>
<td>Intermediate Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 302</td>
<td>Intermediate Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 305</td>
<td>Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 311</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>ECON/ENST 351</td>
<td>Environmental Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON/HIST 362</td>
<td>Eur and Intl Economic Hist</td>
<td>3</td>
</tr>
<tr>
<td>ECON 437</td>
<td>Behavioral Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 442</td>
<td>Economic Development</td>
<td>3</td>
</tr>
<tr>
<td>ECON 444</td>
<td>Economies of the Middle East</td>
<td>3</td>
</tr>
<tr>
<td>ECON 4015</td>
<td>Introduction to Econometrics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours  28

¹ MATH 113 or MATH 115 can be substituted.

**Option D. Museum Studies**

**Code**  | **Title**                                | **Credit** |
|----------|------------------------------------------|------------|

**Prerequisites**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH 101</td>
<td>Understand Art-Ancient to 1400</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 102</td>
<td>Understanding Art 1400 to Now</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 103</td>
<td>Arts of Asia</td>
<td>3</td>
</tr>
</tbody>
</table>
  or ARTH 106  Architecture & Society

**Required Courses**

Select four courses from four different areas:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH/HUM 311</td>
<td>Art of China</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/HUM 312</td>
<td>Art of Japan</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/HUM 313</td>
<td>Chinese Painting</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/HUM 315</td>
<td>Early Chinese Art and Culture</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 384</td>
<td>Islamic Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 385/ RELS 384</td>
<td>Islamic Decorative Arts</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/WGST 416</td>
<td>Ear Mod Jpn Paint&amp;Wood Prnts</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/HUM 319</td>
<td>Egyptian Art</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 321</td>
<td>Greek Art</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 322</td>
<td>Roman Art</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/RELS 327</td>
<td>Gods, Myth and Worship</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/WGST 425</td>
<td>Women in Classical Antiquity</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 426</td>
<td>City of Ancient Rome</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 427</td>
<td>Greek Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 428</td>
<td>Roman Art and Memory</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/RELS 331</td>
<td>Erly Christian Byzant Art</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 332</td>
<td>Early Med and Romanesque Art</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 333</td>
<td>Gothic Art and Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 334</td>
<td>The 14th Century</td>
<td>3</td>
</tr>
<tr>
<td>ARTH/HUM/ RELS/WGST 335</td>
<td>Women in Medieval Art</td>
<td>3</td>
</tr>
</tbody>
</table>

Renaissance & Baroque (CARB):
### Option E. Political Science (International Affairs)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

**Prerequisites**

- POL 201 Politics Around the World 3
- ECON 201 Prin: Macroeconomics 3
- ECON 202 Prin: Microeconomics 3

Select one of the following courses (CAIM): 3

- CIS/CCM 150 Computer Science I 3
- PSYC 381 Prin of Stat and Exper Design 3
- POL 300 Political Analysis 3
- STAT 263 Introduction to Statistics 3

**Required Courses**

Select five of the following 3 credit hour courses (CAIP): 15

- LIBS 364 The European Union 3
- POL 341 Canadian Politics 3
- POL 350 Pol of the Developing Areas 3
- POL/RELS 355 Religion and Politics 3
- POL 361 American Foreign Policy 3
- POL 371 Problems in Intl Politics 3
- POL 375 Great Pwrs Comp and Conflict 3
- POL 385 Israeli-Palestinian Conflict 3
- POL 450 Revolution 3
- POL 451 Peace and War 3
- POL 471 American Foreign Policy I 3
- POL 472 American Foreign Policy II 3

**Also Required**

- ARTH 410 Museum Practice Seminar I 21

**Total Credit Hours**

21

**Note:** Normally, students will not be permitted to count a Political Science Internship (POL 494 POL 495 POL 496 POL 497) as part of the above concentration requirements. They are encouraged to elect an internship as part of their Cognates.

### Option F. Environmental Studies

**Prerequisites**

3 courses to be chosen from at least two of the following areas:

- **Area A.** ESCI 275 or ESCI 301 (CAPS)
- **Area B.** ENST 201, ENST 203, ENST 204; GEOL 118 (CAPB)
- **Area C.** CIS 150; CIS 112 (CAPU)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

**Required Courses**

- ENST/STS 301 Concepts of Environmentalism 3
- ENST 305 Env Instrumentation and Analys 3

Select three additional courses from the following (CAIV): 9

- ENST/GEOG/STS 308 Urban Geography 3
- ENST/POL/STS 325 Environmental Politics 3
- ENST/ESCI 330 Land Use Planning and Mgmt 3
- ENST/EDD 474 Environmental Education 3
- ENST/EDD 486 Environmental Interpretation 3

**Total Credit Hours**

15

**Note:** Environmental Science (ESCI) courses (some of which have additional prerequisites) may be substituted by Petition.

### Option G. Natural Sciences

**Required Courses**

Select one of the following:

A minimum of 15 hours 300-4999 level in any one Dept. of Natural Science discipline from: ASTR, BIOL, BCHM, CHEM, ESCI, GEOL, MICR, PHYS (plus all lower level prerequisites).

Fulfillment of all major requirements in any natural science discipline.

**Total Credit Hours**

15
Option H. Engineering
Required Courses
Fulfillment of all requirements for a degree in any of the Engineering disciplines will satisfy all Component II (Professional) requirements for the International Studies major.

Due to the high number of prerequisites needed to get into upper-level engineering classes, there is no regular 15-hour (professional) component for the various engineering disciplines.

Option I. Communication

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 220</td>
<td>Intro to Media &amp; Culture</td>
<td>3</td>
</tr>
<tr>
<td>SPEE 101</td>
<td>Principles of Speech Comm</td>
<td>3</td>
</tr>
</tbody>
</table>

Required Courses
Five upper-level courses in COMM/SPEE. Of the five courses, one course must be in a Speech (SPEE) upper level course.

Total Credit Hours 21

Option J. Journalism and Screen Studies

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 2015</td>
<td>Fundamentals of Journalism</td>
<td>3</td>
</tr>
<tr>
<td>or JASS 248</td>
<td>Introduction to Screen Studies</td>
<td></td>
</tr>
</tbody>
</table>

Required Courses
Select five courses from the following:
Media Tools (CAJB):
Select two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 303</td>
<td>Media Design &amp; Animation</td>
<td>3</td>
</tr>
<tr>
<td>JASS 307</td>
<td>Copy Editing</td>
<td></td>
</tr>
<tr>
<td>JASS/COMP/ENGL 310</td>
<td>Narrative Journalism</td>
<td></td>
</tr>
<tr>
<td>JASS 312</td>
<td>Media Performance</td>
<td></td>
</tr>
<tr>
<td>JASS 315</td>
<td>Media Productn for Metro Comm</td>
<td></td>
</tr>
<tr>
<td>JASS/ENGL 330</td>
<td>Feature Writing</td>
<td></td>
</tr>
<tr>
<td>JASS/COMP/ENGL 331</td>
<td>Online Reprting,Rsrch,Writing</td>
<td></td>
</tr>
<tr>
<td>JASS 345</td>
<td>Audio Production</td>
<td></td>
</tr>
<tr>
<td>JASS 350</td>
<td>Digital Film &amp; Television</td>
<td></td>
</tr>
<tr>
<td>JASS 3015</td>
<td>Advanced Reporting</td>
<td></td>
</tr>
<tr>
<td>JASS 401</td>
<td>Interpretive Journalism</td>
<td></td>
</tr>
<tr>
<td>JASS 402</td>
<td>Investigative Reporting</td>
<td></td>
</tr>
<tr>
<td>JASS 405</td>
<td>New and Emerging Media</td>
<td></td>
</tr>
<tr>
<td>JASS 410</td>
<td>Advanced Media Production</td>
<td></td>
</tr>
<tr>
<td>JASS 423</td>
<td>Comm Design for Web &amp; Mobile</td>
<td></td>
</tr>
<tr>
<td>JASS/ENGL/HUM 467</td>
<td>Script-Writing Workshop</td>
<td></td>
</tr>
</tbody>
</table>

Genres, Modes, and Contexts of Storytelling (CAJM):
Select two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 302</td>
<td>Media Law and Ethics</td>
<td></td>
</tr>
<tr>
<td>JASS/ART 332</td>
<td>Creating the Graphic Novel</td>
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<tr>
<td>JASS 333</td>
<td>Sports Reporting and Writing</td>
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The remaining one course (3 credits) may be any upper level JASS course

Total Credit Hours 18

Option K. History

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<td>Writing &amp; Rhetoric II</td>
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<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
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<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
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Select five courses from the following. Courses must be from at least two different regions:

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<td>Russian Intellectual History</td>
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<td>HIST 306</td>
<td>20th-C Russian Intel History</td>
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<td>HIST 308</td>
<td>Imperial Russia</td>
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<td>HIST 309</td>
<td>The Russian Revolutions</td>
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<td>HIST 312</td>
<td>Poland - Study Abroad</td>
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<td>HIST 3131</td>
<td>Armenia in the Soviet Period</td>
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<td>HIST 3132</td>
<td>Armenians in the Modern World</td>
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<td>HIST 315</td>
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Genres, Modes, and Contexts of Storytelling (CAJM):
Select two courses from:

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<td>JASS/ART 332</td>
<td>Creating the Graphic Novel</td>
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</tr>
<tr>
<td>JASS 333</td>
<td>Sports Reporting and Writing</td>
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</table>

JASS 334 | Science and Environmental Journalism |
JASS/MHIS 335 | Multimedia and Music |
or JASS 336 | Film and Music |
JASS 338 | Business/Automotive Reporting |
JASS/HUM 357 | National Cinemas |
JASS/ENGL 370 | Narratives of Film and Lit |
JASS 378 | History of U.S. Broadcasting |
JASS 380 | History of American Journalism |
JASS/COMM/MCL 381 | Postwar European Cinema |
JASS/AAAS/HUM 385 | Black Cinema |
JASS/WGST 387 | Gender,Sex,Powr Screen Studies |
JASS 390 | Topics in JASS |
JASS 398 | Independent Study in JASS |
JASS/STS 403 | Issues in Cyberspace |
JASS 406 | History&Theory of Documentary |
JASS 413 | Photojournalism |
JASS/COMP/ENGL 436 | Memoir and Travel Writing |
JASS/HUM 457 | American Cinema |
JASS/ANTH/HUM 477 | Ethnographic Film |
COMM 430 | International Communications |

The remaining one course (3 credits) may be any upper level JASS course

Total Credit Hours 18
Courses should be selected in accordance with students’ particular needs. See below for the approved list of courses.

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<td>AAAS/HUM/ MHIS 388</td>
<td>W. African Music: Trad.&amp;Glob.</td>
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<td>AAAS 491</td>
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<td>ANTH 320</td>
<td>Culture and Int’l Business</td>
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<td>ANTH/AAAS 371</td>
<td>African Exp in the Americas</td>
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<td>Anthropology of Latin America</td>
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<td>Anth Persp on the Middle East</td>
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<td>ANTH 374</td>
<td>Anthropology of Europe</td>
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<tr>
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<td>Culture and Sexuality</td>
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<tr>
<td>ANTH/WGST 420</td>
<td>Kinship and Marriage</td>
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<td>ANTH/LING 425</td>
<td>Language and Society</td>
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<td>ANTH/REL 440</td>
<td>Religion and Culture</td>
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<td>Gender and Globalization</td>
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<td>ANTH 482</td>
<td>Psychological Anthropology</td>
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<td>Art of Japan</td>
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<td>Chinese Painting</td>
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<td>Early Chinese Art and Culture</td>
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<td>Greek Art</td>
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<td>Early Christian Byzant Art</td>
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<td>Early Med and Romanesque Art</td>
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<td>Gothic Art and Architecture</td>
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<td>The 14th Century</td>
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<td>Women in Medieval Art</td>
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<td>Art&amp;Arch in Early Ren Florence</td>
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<td>ARTH 342</td>
<td>High Renaissance and Mannerism</td>
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<td>Renaissance &amp; Reformation Art</td>
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<td>Northern Baroque Art</td>
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<td>Impressionism and Post-Impress</td>
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<td>Arts of the Twentieth Century</td>
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<td>ARTH 364</td>
<td>Picasso</td>
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<td>ARTH 365</td>
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<tr>
<td>ARTH 384</td>
<td>Islamic Architecture</td>
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**Component III. Cognates**

This component is designed to enhance the international dimension of the major and to coordinate the language and culture studies with professional preparation. Students will take three courses (9 hours, 300+ level) in fields such as anthropology, art history, business and management, economics, foreign cultures, history, and political science.
<table>
<thead>
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<th>Course Code</th>
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<tr>
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<td>ARTH/WGST 416</td>
<td>Early Mod Jpn Paint&amp;Wood Prnts</td>
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<td>ARTH 426</td>
<td>City of Ancient Rome</td>
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<tr>
<td>ARTH/HUM 434</td>
<td>Renaissance and Baroque Rome</td>
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<td>BA 400</td>
<td>Corporate Responsibility</td>
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<td>HRM 305</td>
<td>Human Resource Policy/Admin</td>
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<tr>
<td>HRM 408</td>
<td>Legal Issues in Human Resource</td>
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<tr>
<td>IB 441</td>
<td>International Financial Mgmt</td>
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<tr>
<td>IB 486</td>
<td>Seminar: International Bus</td>
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<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
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<td>MKT 382</td>
<td>Understanding Customers</td>
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<tr>
<td>MKT 457</td>
<td>Gbl Mktg&amp;Consumr Cultr</td>
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<td>OB 354</td>
<td>Behavior in Organization</td>
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<td>COMM 366</td>
<td>Public Comm and Culture Studies</td>
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<td>COMM 430</td>
<td>International Communications</td>
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<td>COMM/WGST 455</td>
<td>Gender and Media Studies</td>
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<tr>
<td>COMM/ANTH/SOC/WGST 481</td>
<td>Gender and Globalization</td>
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<td>COML/HUM 355</td>
<td>Urban Voices: France and Italy</td>
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<td>Economies of the Middle East</td>
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<td>ECON 447</td>
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<td>ENGL 372</td>
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<td>ENGL 373</td>
<td>English Lit 1600-1660</td>
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<td>ENGL 420</td>
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<td>Arabic Cinema</td>
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<td>FREN 336</td>
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<td>FREN 337</td>
<td>France in the 20th Century</td>
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<td>France of Today</td>
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<td>GER 305</td>
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<td>SPAN 356</td>
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<td>Geography of Western Europe</td>
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<td>GEOG/ENST 310</td>
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<td>Imperial Russia</td>
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<td>The Russian Revolutions</td>
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<td>HIST 321</td>
<td>Late Imperial China</td>
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<td>Traditional China</td>
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<td>History of Modern China</td>
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<td>Traditional Japan</td>
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<td>Medieval Society</td>
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<td>The Renaissance</td>
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<td>The Reformation Era: 1500-1648</td>
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<td>Modern Middle East, 1918-1945</td>
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<td>Lebanon in Modern Middle East</td>
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### Journalism and Screen Studies

The Bachelor of Arts in Journalism and Screen Studies (JASS) is dedicated to storytelling—its forms, techniques, and technologies. We offer individual courses on the genres, including news, features and photojournalism; narrative journalism/creative nonfiction; documentary and feature film. In all courses, JASS stresses convergent media, interdisciplinary, and the underlying research and writing skills that connect us as journalists, documentarians and filmmakers.

The program looks at storytelling as a means to both inform and entertain. The ability to analyze and interpret work in a specific medium and to view it within a variety of interpretive contexts provides a foundation for all forms of storytelling, from news reportage to feature films.

While we offer individual courses in each medium, all courses include analytical components and assignments, and all stress the interdependency of theory and practice, form and content. JASS makes current and emerging technologies available to all its students, emphasizing these technologies, not as ends in themselves but as tools of intellectual and creative expression.

#### Notes:

1. Students may elect the Humanities Internship (HUM 485) for a maximum of three hours and avail themselves of on-the-job experience in a business, governmental, or cultural institution. See the INST Program Director for Internship Guidelines.
2. Students with appropriate background in political science may elect one of the various political science internships POL 494 POL 495 POL 496 POL 497) for a maximum of three hours.
3. Students may use upper-level courses, especially culture/civilization, literature, or film courses, in another foreign language for Cognate credit. Students may not use courses in the same foreign language designated as Component I for Cognates credit.
4. Students may not use identical areas for both Components II and III, e.g., students with Professional Studies (Component II) in Business and Management may not select Business and Management courses for Cognates (Component III) credit.
5. Students’ course choice in Components II and III must include a minimum total of two courses with a clearly international dimension; a greater number is highly desirable.
6. Students may transfer no more than 9 upper level hours in professional concentrations.

#### Components:

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<tr>
<td>II</td>
<td>POL 494</td>
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<tr>
<td>III</td>
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#### Liberal Studies

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<td>Environmental Politics</td>
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<td>POL 451</td>
<td>Peace and War</td>
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<td>POL 471</td>
<td>American Foreign Policy</td>
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<td>POL 500</td>
<td>Pol of the Developing Areas</td>
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<td>POL 501</td>
<td>Problems in Int'l Politics</td>
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<td>POL 505</td>
<td>Kant and the 19th Century</td>
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<td>POL 537</td>
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#### Philosophy

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<td>PHIL 305</td>
<td>Kierkegaard &amp; Nietzsche</td>
<td>3</td>
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<td>PHIL 327</td>
<td>World Englishes</td>
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<td>PHIL/HUM 415</td>
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#### Humanities

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#### Journalism and Screen Studies

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<td>JASS/HUM 357</td>
<td>National Cinemas</td>
<td>3</td>
</tr>
<tr>
<td>JASS/COMM/MCL 381</td>
<td>Postwar European Cinema</td>
<td>3</td>
</tr>
<tr>
<td>LIIS 364</td>
<td>The European Union</td>
<td>3</td>
</tr>
<tr>
<td>LING/ENGL 484</td>
<td>World Englishes</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 303</td>
<td>Marx and the 19th Century</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 305</td>
<td>Existentialism and Its Sources</td>
<td>3</td>
</tr>
<tr>
<td>PHIL/HUM 415</td>
<td>Existentialism and Its Sources</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Political Science

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POL 307</td>
<td>Marxist Thought</td>
<td>3</td>
</tr>
<tr>
<td>POL/ENST/STS 325</td>
<td>Environmental Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 350</td>
<td>Political Science</td>
<td>3</td>
</tr>
<tr>
<td>POL 361</td>
<td>American Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 370</td>
<td>Communist &amp; Post-Communist Sys</td>
<td>3</td>
</tr>
<tr>
<td>POL 371</td>
<td>Problems in Int'l Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 385</td>
<td>Israeli-Palestinian Conflict</td>
<td>3</td>
</tr>
<tr>
<td>POL 450</td>
<td>Revolution</td>
<td>3</td>
</tr>
<tr>
<td>POL 472</td>
<td>American Foreign Policy I</td>
<td>3</td>
</tr>
<tr>
<td>POL 473</td>
<td>International Security Affairs</td>
<td>3</td>
</tr>
<tr>
<td>POL/CRJ 481</td>
<td>Terrorism &amp; US Natl Security</td>
<td>3</td>
</tr>
<tr>
<td>POL/ENST 487</td>
<td>Comparative Enviro Policy</td>
<td>3</td>
</tr>
<tr>
<td>POL 494</td>
<td>Internship Seminar</td>
<td>3</td>
</tr>
<tr>
<td>POL 495</td>
<td>Public Affairs Internship</td>
<td>3-6</td>
</tr>
<tr>
<td>POL 497</td>
<td>Washington, D.C. Internship</td>
<td>3-6</td>
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#### Sociology

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 405/404/405</td>
<td>Dissed: Differ, Power, Discrim</td>
<td>3</td>
</tr>
<tr>
<td>SOC/ANTH 404</td>
<td>Sociology of Religion</td>
<td>3</td>
</tr>
<tr>
<td>SOC 460</td>
<td>America in a Global Society</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Women & Gender Studies

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGST/ANTH 315</td>
<td>Body Image and Culture</td>
<td>3</td>
</tr>
</tbody>
</table>
Experiential Education (Internship, Co-op, or Senior Thesis)
All JASS students are required to participate in an internship, co-op or senior thesis. There is a seminar component to both the internship and the co-op.

The senior thesis is available only to students who have prior JASS industry experience.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

 Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

- Ancient Greek I and II MCL 105 and MCL 106
- Arabic I and II ARBC 101 and ARBC 102
- Armenian I and II MCL 111 and MCL 112
- Chinese I and II CHIN 101 and CHIN 102
- French I and II FREN 101 and FREN 102
- German I and II GER 101 and GER 102
- Latin I and II LAT 101 and LAT 102
- Spanish I and II SPAN 101 and SPAN 102

Prerequisites to the Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 2015</td>
<td>Fundamentals of Journalism</td>
<td>3</td>
</tr>
<tr>
<td>JASS/ENGL/HUM 248</td>
<td>Introduction to Screen Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 6

Journalism and Screen Studies Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS/COMP/ENGL 310</td>
<td>Narrative Journalism</td>
<td>3</td>
</tr>
</tbody>
</table>

Required Experiential Education
Select one of the following:

- HUM 485/Internship
- HIST 3085
- LIBS 395/Co-op Education Work Assignment (co-op)
- JASS 497/JASS Thesis (senior thesis; Faculty approval required)

Required Narrative Writing Course

- JASS/COMP/ENGL 310/Narrative Journalism 3

Concentration
Select Option A: Journalism or Option B: Screen Studies 21

Total Credit Hours 27

Option A: Journalism Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 303</td>
<td>Media Design &amp; Animation</td>
<td>12</td>
</tr>
<tr>
<td>JASS 3015</td>
<td>Advanced Reporting</td>
<td></td>
</tr>
<tr>
<td>JASS 307</td>
<td>Copy Editing</td>
<td></td>
</tr>
<tr>
<td>JASS 312</td>
<td>Media Performance</td>
<td></td>
</tr>
<tr>
<td>JASS/ENGL 330</td>
<td>Feature Writing</td>
<td></td>
</tr>
<tr>
<td>JASS/COMP/ENGL 330</td>
<td>Online Reporting, Rsrch, Writing</td>
<td></td>
</tr>
<tr>
<td>JASS 345</td>
<td>Audio Production</td>
<td></td>
</tr>
<tr>
<td>JASS 350</td>
<td>Digital Film &amp; Television</td>
<td></td>
</tr>
</tbody>
</table>
### Option A: Journalism Concentration

**Required Core Area I: Media Tools (CATS)**

Select 4 courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 303</td>
<td>Media Design &amp; Animation</td>
<td>3</td>
</tr>
<tr>
<td>JASS 312</td>
<td>Media Performance</td>
<td>3</td>
</tr>
<tr>
<td>JASS 315</td>
<td>Media Productn for Metro Comm</td>
<td>3</td>
</tr>
<tr>
<td>JASS/COMP/ENGL 331</td>
<td>Online Reprinting, Rsrch, Writing</td>
<td>3</td>
</tr>
<tr>
<td>JASS 345</td>
<td>Audio Production</td>
<td>3</td>
</tr>
<tr>
<td>JASS 350</td>
<td>Digital Film &amp; Television</td>
<td>3</td>
</tr>
<tr>
<td>JASS 405</td>
<td>New and Emerging Media</td>
<td>3</td>
</tr>
<tr>
<td>JASS 409</td>
<td>Advanced Media Production</td>
<td>3</td>
</tr>
<tr>
<td>JASS 421</td>
<td>Environmental Filmmaking</td>
<td>3</td>
</tr>
<tr>
<td>JASS 423</td>
<td>Comm Design for Web &amp; Mobile</td>
<td>3</td>
</tr>
<tr>
<td>JASS/COMP/ENGL 436</td>
<td>Memoir and Travel W</td>
<td>3</td>
</tr>
<tr>
<td>JASS 497</td>
<td>JASS Thesis (Faculty approval required)</td>
<td>3</td>
</tr>
<tr>
<td>COMM 430</td>
<td>International Communications</td>
<td>3</td>
</tr>
<tr>
<td>HUM 485/</td>
<td>Internship (second internship)</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3085</td>
<td>Internship (second internship)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 21

### Required Core Area II: Genres, Modes, & Contexts of Storytelling (CAGM)

Select 3 courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS/ART 332</td>
<td>Creating the Graphic Novel</td>
<td>3</td>
</tr>
<tr>
<td>JASS/MHIS 335</td>
<td>Multimedia and Music</td>
<td>3</td>
</tr>
<tr>
<td>JASS/MHIS 336</td>
<td>Film and Music</td>
<td>3</td>
</tr>
<tr>
<td>JASS/HUM 357</td>
<td>National Cinemas</td>
<td>3</td>
</tr>
<tr>
<td>JASS/ENGL 370</td>
<td>Narratives of Film and Lit</td>
<td>3</td>
</tr>
<tr>
<td>JASS 378</td>
<td>History of U.S. Broadcasting</td>
<td>3</td>
</tr>
<tr>
<td>JASS/COMM/MCL 381</td>
<td>Postwar European Cinema</td>
<td>3</td>
</tr>
<tr>
<td>JASS/AAAS/HUM 385</td>
<td>Black Cinema</td>
<td>3</td>
</tr>
<tr>
<td>JASS/WGST 387</td>
<td>Gender, Sex, Powr Screen Studies</td>
<td>3</td>
</tr>
<tr>
<td>JASS 390</td>
<td>Topics in JASS</td>
<td>3</td>
</tr>
<tr>
<td>JASS 398</td>
<td>Independent Study in JASS (approved contract required)</td>
<td>3</td>
</tr>
<tr>
<td>JASS/STS 403</td>
<td>Issues in Cyberspace</td>
<td>3</td>
</tr>
<tr>
<td>JASS 404</td>
<td>Video Game Studies &amp; Criticism</td>
<td>3</td>
</tr>
<tr>
<td>JASS 406</td>
<td>History &amp; Theory of Documentary</td>
<td>3</td>
</tr>
<tr>
<td>JASS 413</td>
<td>Photojournalism</td>
<td>3</td>
</tr>
<tr>
<td>JASS/COMP/ENGL 436</td>
<td>Memoir and Travel W</td>
<td>3</td>
</tr>
<tr>
<td>JASS 440</td>
<td>Theory of the Screen</td>
<td>3</td>
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<tr>
<td>JASS/HUM 457</td>
<td>American Cinema</td>
<td>3</td>
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<tr>
<td>JASS/ANTH/HUM 477</td>
<td>Ethnographic Film</td>
<td>3</td>
</tr>
<tr>
<td>JASS 497</td>
<td>JASS Thesis (Faculty approval required)</td>
<td>3</td>
</tr>
<tr>
<td>HUM 485/</td>
<td>Internship (second internship)</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3085</td>
<td>Internship (second internship)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 21

**Notes:**

1. A maximum of 63 credit hours of JASS may count toward the 120 credit hours required for graduation.
2. At least 15 of the 27 upper level credit hours in the JASS major must be elected at UM-D.
3. The Thesis option (JASS 497) is only available to students who have significant professional experience in their area of specialization within Journalism or Screen Studies and requires the approval of the JASS faculty advisor.
4. Students wishing to undertake an independent study (JASS 398) must first secure the approval of the JASS faculty member willing to serve as advisor.
5. A maximum of 6 credits of internship (HUM 485) or co-op (LIBS 395, LIBS 396, LIBS 397) may count toward the major (3 credits to fulfill the experiential education requirement and 3 credits as a second internship/co-op taken in a term separate from the first internship/co-op and may apply toward the Genres, Modes, and Contexts area II.

### Minor or Integrative Studies Concentration Requirements

A minor or concentration in Journalism and Screen Studies (JASS) consists of 12 credit hours of approved upper-level courses. At least two of the courses (6 credits) must be in the “Media Tools” area and at least
two courses (6 credits) must be in the “Genres, Modes and Contexts of Storytelling” area.

<table>
<thead>
<tr>
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<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>JASS 2015</td>
<td>Fundamentals of Journalism</td>
<td>3</td>
</tr>
<tr>
<td>or JASS 248</td>
<td>Introduction to Screen Studies</td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisites**

Choose two from:

- JASS 303 Media Design & Animation
- JASS 307 Copy Editing
- JASS/COMP/ENGL 310 Narrative Journalism
- JASS 312 Media Performance
- JASS 315 Media Productn for Metro Comm
- JASS/ENGL 330 Feature Writing
- JASS/COMP/ENGL 331 Online Reprting,Rsrch,Writing
- JASS 345 Audio Production
- JASS 350 Digital Film & Television
- JASS 3015 Advanced Reporting
- JASS 401 Interpretive Journalism
- JASS 402 Investigative Reporting
- JASS 405 New and Emerging Media
- JASS 410 Advanced Media Production
- JASS 423 Comm Design for Web & Mobile
- JASS/ENGL 467 Script-Writing Workshop

**Genres, Modes, and Contexts of Storytelling (CAJM)**

Choose two from:

- JASS 302 Media Law and Ethics
- JASS/ART 332 Creating the Graphic Novel
- JASS 333 Sports Reporting and Writing
- JASS 334 Science and Environmental Journalism
- JASS/MHIS 335 Multimedia and Music
- or JASS 336 Film and Music
- JASS 338 Business/Automotive Reporting
- JASS/HUM 357 National Cinemas
- JASS/ENGL 370 Narratives of Film and Lit
- JASS 378 History of U.S. Broadcasting
- JASS 380 History of American Journalism
- JASS/COMM/MCL 381 Postwar European Cinema
- JASS/AAAS/HUM 385 Black Cinema
- JASS/WGST 387 Gender,Sex, Powr Screen Studies
- JASS 390 Topics in JASS
- JASS 398 Independent Study in JASS (approved contract required)

**Topics in JASS**

- JASS/COM/ENGL 436 Memoir and Travel Writing
- JASS/HUM 457 American Cinema
- JASS/ANTH/HUM 477 Ethnographic Film
- COMM 430 International Communications

Total Credit Hours: 15

**JASS 2015 Fundamentals of Journalism 3 Credit Hours**

Study and practice in newspaper reporting and news gathering, interview techniques, and basic newswriting skills. Students will also discuss libel law, ethics, and the use of the Freedom of Information Act. (YR).

Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

**JASS 240 Film and Society 3 Credit Hours**

A survey of the major genres of film, chiefly in historical and political perspective, but also in the light of important intellectual frameworks (e.g., feminism, psychoanalytical theory). The films selected, both Western and non-Western, will be examined both for their visual codes of meaning and for their wider role in developing a powerful social language in various cultural contexts. (YR).

**JASS 248 Introduction to Screen Studies 3 Credit Hours**

This course will introduce students to the development of world cinema by integrating the aesthetics of film with its technology, and its social and economic milieu. It will train the students in analyzing the formalist qualities of the medium, and in understanding the evolution of its various genres and styles. (YR).

**JASS 248 Introduction to Screen Studies 3 Credit Hours**

Advanced study and practice in news reporting and writing. Students will gain experience with in-depth reporting through coverage of developing news stories. Longer articles of publishable quality are required. (OC).

Prerequisite(s): COMP 2015 or JASS 2015

**JASS 302 Media Law and Ethics 3 Credit Hours**

The basis of reportorial journalism is its foundation in the First Amendment. This course examines the legal restrictions and freedoms governing print media and explores the ethical responsibilities of print journalists. Specific topics covered include First Amendment law, the clear and present danger standard, defamation and libel, privacy, obscenity, free press/fair trial, access, shield laws, and journalism ethics.

**JASS 303 Media Design & Animation 3 Credit Hours**

This course will introduce students to the fundamentals of graphic design in a convergent media landscape, with an emphasis on animation and motion graphics. Students will develop skills in the fundamentals of color, typography and layout, as well as build practical skills in animation technique. Animation projects may include animated lower thirds, color, typography and layout, as well as build practical skills in animation technique. Students may not receive credit for both JASS 303 and JASS 250 (F,W,S).

Restriction(s):
- Cannot enroll if Class is Undergraduate NCFD or Post-baccalaureate NCFD or Specialist or Undergrad Certification only or Post-baccalaureate Cert only or Graduate or Doctorate
JASS 307  Copy Editing  3 Credit Hours
Course covers manuscript and electronic editing of news and feature stories, editing for libel and taste, fact-checking, writing headlines and captions, and use of reference books. Includes a review of grammar and work usage, punctuation, spelling, and style.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 310  Narrative Journalism  3 Credit Hours
Students learn to identify, understand and use the techniques of fiction in the service of nonfiction material. While studying the texts as literature, students are also encouraged to view them as models for writing. Assignments include the writing and revising of articles, based on research and interviews, and writing in story form, drawing on literary techniques. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 312  Media Performance  3 Credit Hours
This course focuses on voice, diction, and movement for the various media of electronic and digital production. The emphasis is on developing skills in announcing, news reading, on-camera stand ups, voice-overs as well as dramatic interpretation and performance. Students will be exposed to a variety of projects and assignments, along with strategies for developing on-air personalities, voices, and characters. Basics of professional dress and makeup will also be discussed. Students will be expected to submit a professional portfolio of their on-air work at the end of the semester. (AY)

JASS 315  Media Productn for Metro Comm  3 Credit Hours
This community-based course partners with a community organization to produce media projects that serve the needs of the organization. Students will build skills in intermediate aspects of media production including concept development, research, proposals and pitching, scriptwriting, producing, shooting, editing, and sound design, as well as professional and organizational communication skills. Students will also develop a broader understanding of community engagement, citizenship, and issues impacting the Detroit Metro community. Productions will include both studio experience and fieldwork.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 330  Feature Writing  3 Credit Hours
An introduction to the writing of feature stories for newspapers and magazines. Students study methods of gathering information and of preparing a manuscript for publication. (AY).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 331  Online Reprtng,Rsrch,Writing  3 Credit Hours
Course introduces the technical, social, legal and ethical practice of online research, focusing specifically on reporting (i.e. research and interview) skills required by journalists and others. Students use new media technology to generate ideas, to research subjects, and to develop general-audience writing projects in their areas of interest. Course covers the use of Web search engines, directories and databases; finding sources and interviewing people online; evaluating the credibility of online sources and information; using Lexis-Nexis to access archives and public records; and using spreadsheet and database programs.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 332  Creating the Graphic Novel  3 Credit Hours
This course focuses on the creation of an original graphic novel from inception to fully developed story. Students work on character, plot development, dialogue, drawing style, and layout planning, and are encouraged to introduce any cross-disciplinary techniques such as digital applications when appropriate. Lectures and readings consider contemporary media.
Prerequisite(s): ART 202 or ART 206
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 333  Sports Reporting and Writing  3 Credit Hours
In this course, students not only learn how to write a sports story and report it across a variety of media, they also examine and write about relevant issues, from race and gender to sportsmanship and hero worship. In addition to assigned class readings, students read and report on one sports-related film and one book, chosen from a list of classics posted on CTools, and write a final paper in which they address an issue relevant to sports reporting. Local and national practitioners contribute their thoughts on a variety of subjects throughout the term.
Prerequisite(s): JASS 2105
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 334  Science and Environmental Jour  3 Credit Hours
This course introduces the practice and theory of science and environmental journalism. Students report and write short science and environmental articles across a variety of media. They also examine the history, ethics and politics of environmental and science journalism and isolate a relevant issue as the focus of a research project, which will later generate a longer science/environment feature story. After instructor critique, students revise all work and submit a final ePortfolio.
Prerequisite(s): JASS 2105
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 335  Multimedia and Music  3 Credit Hours
In this course, students will explore case studies of music created, performed, and distributed in combination with other media from the 1960s to the present. Multimedia is understood as any context in which several media are integrated, but particular focus will be paid to technological and creative innovations (such as video games, computers, and phones). The use of music will be considered in such media as film and television, multimedia performance and installation art, and international developments in multimedia production and distribution.
Prerequisite(s): MTHY 100 or MTHY 101 or MTHY 102 or MHIS 100 or MHIS 120 or MHIS 130 or MHIS 150

JASS 336  Film and Music  3 Credit Hours
In this course, students will be introduced to the varieties of music used in film from c. 1900 to the present. Topics covered include a basic introduction to the musical features of Western European dramatic music; the role of music in the early decades of the 20th century; the growth of film and musical sound in the “classic era” of Hollywood film; the use of music in specific genres such as film noir, science-fiction, epic, and musicals; and the use of popular song in film. Prerequisite: previous completion of MHIS 100, 120, 130, or by permission of the instructor.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130
JASS 338  Business/Automotive Reporting  3 Credit Hours
This course covers two inter-related areas: finance and automotive journalism. Students learn how to cover the economy and business community, focusing on areas such as Wall Street, economic indicators, stocks and bonds. Since the University of Michigan-Dearborn is located in the heart of the world automotive industry, the course also emphasizes the skills necessary for a career in automotive journalism, specifically how to read and report auto-related financial, environmental, safety, labor, finance and manufacturing documents. An introductory course in Economics is recommended.
Prerequisite(s):  JASS 2015

JASS 345  Audio Production  3 Credit Hours
This hands-on course will introduce students to the basic theories of audio and audio program production, including the fundamentals of digital audio and studio and remote recording. The course is designed to instill upon students the importance of sound in the electronic media and how its use or misuse can enhance or detract from media productions. Readings, lectures and projects are designed to teach students how to discern good audio from bad and how to avoid pitfalls media producers and directors commonly make. Through the practical application of audio concepts in the radio laboratory and through critiques of radio projects and programs, students will gain the insight and experience they will need to successfully design and execute audio strategies for the electronic media.
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 350  Digital Film & Television  3 Credit Hours
Media production taught in the context of the history, aesthetics and technologies of film and television. Purpose of the course is to provide students with a working knowledge and critical awareness of digital production through classroom instruction and studio training. Course counts toward minor in Communications. (YR)
Prerequisite(s): (ENGL 248 or HUM 248 or JASS 248 or FILM 248)

JASS 357  National Cinemas  3 Credit Hours
This course will introduce students to the national cinemas of a select country. By contrasting the evolution of cinema in the East, with the dominant genres and conventions of Hollywood, the course will enable students to critically examine non-Hollywood narratives; the interaction of various nationalistic movements within the institution of cinema; and the ways in which world cinema has been inflected by various indigenous performance practices and other visual representations. (OC).
Prerequisite(s): HUM 240 or JASS 240 or FILM 240 or ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 370  Narratives of Film and Lit  3 Credit Hours
Explores the narrative conventions of literary and filmic fictions in a cultural, historical and psycho-analytical context. The course goes beyond a discussion of the relative merits of novels and their respective film adaptations and examines the more complex interchanges between the two narrative forms; the ideological function of narrative in contemporary society; and the effect of the medium of a fictional text on the reader/viewer. (OC).
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 378  History of U.S. Broadcasting  3 Credit Hours
A survey of the history of broadcasting in the United States, from the development of radio at the turn of the 20th century to the rise of cable television in the late 20th century. The course focuses on the business, political and demographic factors guiding the various broadcasting industries; the development and shifts of programming genres over time; and a wide look at the social impact of broadcasting in the country.

JASS 380  History of American Journalism  3 Credit Hours
This course surveys the history of American journalism from the Colonial period to the present. Topics explored include the development of print journalism, the rise of the reading public, the growth of advertising, photojournalism, and the tabloid press, and the evolution of electronic journalism from radio and television through the computer age. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 381  Postwar European Cinema  3 Credit Hours
The course will concentrate on a series of films from various European countries with a focus on the socio-political issues, historical events and cultural preoccupations that have defined and also challenged European societies from WWII to the present. Zeroing in on the construction of European identities, the course will analyze and compare modes of narrating national, class, racial, sexual and social differences in different European nations. Themes such as memories of war and the Holocaust, new conflicts, class, immigration, women’s rights, gender, and East-West relations will be addressed. The course will thus privilege a cinema that offers a “récit,” a story. Particular attention will be given to discourses on otherness and on the ways in which film culture has reflected, reinforced, reshaped and, in some instances, contested Europe’s past and current dominant ideologies and identities. Readings by cultural historians and analysts will provide the context for an understanding of the films. The course will conclude with a discussion of the possible existence of a specific postwar European Cinema.
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

JASS 385  Black Cinema  3 Credit Hours
This course will examine selected films from African American and African film traditions in order to analyze how their cultural production is responsive to the conditions of social oppression, economic underdevelopment, and neo-colonialism. How film traditions define "Black aesthetics" will also be discussed. (AY).

JASS 387  Gender, Sex, Power Screen Studies  3 Credit Hours
This course examines representations of gender and sexuality across multiple screens, with a particular emphasis on Hollywood, independent, and non-Western cinema. In addition, the course explores intersections of gender with race, class, and ability to further investigate power structures in contemporary screen studies. The course will engage with a range of debates in film theory and women's and gender studies, and enable students to apply concepts and theories to specific media texts.
Prerequisite(s): HUM 240 or JASS 240 or FILM 240 or ENGL 248 or HUM 248 or JASS 248 or FILM 248

JASS 389  Topics in JASS  3 Credit Hours
Examination of problems, issues, technology and critical issues in advanced subject areas in journalism and screen studies. Title as listed in schedule of classes changes according to content. Course may be repeated for credit when specific topics differ.
Restriction(s):
Can enroll if Class is Junior or Senior

JASS 398  Independent Study in JASS  1 to 3 Credit Hours
Readings, supervised practice or analytical assignments in Journalism and Screen Studies, determined in accordance with the needs and interests of those enrolled. May count toward JASS minor.
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Arts, Sciences, and Letters
JASS 401 Interpretive Journalism  3 Credit Hours
A study in the reading and writing of newspaper columns, editorials and reviews. Course prepares students to write newspaper columns as well as reviews and interpretive pieces on the arts. It examines current writing on literature, drama, cinema, graphic arts and music, and includes a study of the newspaper/magazine column.

JASS 402 Investigative Reporting  3 Credit Hours
A course in investigating a subject and writing a publishable story. Course covers the rudiments of investigative reporting: preliminary research, story selection, investigative strategies and resources, interviewing, and evaluation of material. Examines the history and current status of investigative reporting, including its ethics and politics. Students write and edit several articles and focus on two longer investigative pieces. (YR).
Prerequisite(s): COMM 2015 or JASS 2015

JASS 403 Issues in Cyberspace  3 Credit Hours
This course will explore some of the current social, political, legal, and technological issues associated with the use of new media technology to move ideas and information in a democratic society. Examples of areas to be explored include the Internet and World Wide Web, privacy, the future of the mass audience, and the meaning of the First Amendment in the 21st Century. Students cannot receive credit for both COMM 403 and COMM 503. (OC)
Restriction(s):
Cannot enroll if Class is Graduate

JASS 404 Video Game Studies & Criticism  3 Credit Hours
This course will explore some of the current social, cultural, legal, and aesthetic issues associated with video games as an immensely popular new media technology that has sparked a dynamic user culture. Examples of areas to be explored include ludology and narratology, narrative architecture and game spaces, ethical questions and controversies, and player experience and communities. (YR)

JASS 405 New and Emerging Media  3 Credit Hours
This workshop-oriented course focuses on expanding conceptual and technical skills in emerging forms of media storytelling in an online context, including interactive narrative, collage, database cinema, eBooks, and apps for mobile devices. The course integrates a range of software and interfaces with an emphasis on the conceptual and creative applications of these tools. Students may not receive credit for both JASS 405 and COMM 405. Students who have taken JASS 405 under the course title "Web Design" are not allowed to take the course for credit again under the title "New and Emerging Media."
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40) and (JASS 345 or JASS 350)

JASS 406 History & Theory of Documentary  3 Credit Hours
This course surveys the history of European documentary and explores its ethical, legal and economic issues. Students study documentary's central moments, forms and artists; the changing theoretical approaches to documentary making; and the range of documentary purposes (informational, educational, propagandistic, entertainment). The course also provides historical and theoretical background for those students who wish to pursue their interest in documentary in the script-writing and production courses also offered in the Journalism and Screen Studies Discipline.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

JASS 410 Advanced Media Production  3 Credit Hours
The course covers advanced concepts in media production and provides a pre-professional opportunity to direct. Elements include scripting and organization, producing, and post-production editing techniques. Emphasis is placed on individual and small group work in both field and studio settings, leading to the creation of a professional broadcast-quality portfolio program or segment. May be repeated once for credit.
Prerequisite(s): JASS 350 or COMM 350 or JASS 405 or JASS 406 or JASS 345

JASS 413 Photojournalism  3 Credit Hours
A hands-on digital imaging course in which students learn the basics of photojournalism and photography, including subject selection, composition, cropping, retouching and caption writing.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

JASS 421 Environmental Filmmaking  3 Credit Hours
Environmental Filmmaking combines theory and practice in the examination of issues related to the environment and ecology as represented in film and television. Students will analyze the medium's ability to effectively communicate and integrate scientific and technical information about the natural world to target an audience. The course will include online screenings selected from a variety of eras and genres, readings in the field of eco-criticism, the development of a documentary treatment and the production of an original multimedia project focusing on an environmental issue. (F, AY)
Prerequisite(s): JASS 248 or ENST 301

JASS 436 Memoir and Travel Writing  3 Credit Hours
A course in narrative non-fiction that focuses on memoir and travel writing. Reading involves several books as well as classic essay-length examples. Assignments include both short analytical papers and the writing and revising of three original articles, based on research, interviews, memory, and observation, and drawing on literary techniques. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280

JASS 440 Theory of the Screen  3 Credit Hours
A study of the art, technology, language and theory of the screen arts through an analysis of their formalist elements and medium-specific codes. Film language, representations of art and reality, authorship, spectatorship and globalization are among the core concepts that will be examined. The course includes extensive online screenings of a variety of films encompassing a number of different forms and genres. (F)
Prerequisite(s): JASS 248 or ENGL 248 or HUM 248 or FILM 248

JASS 457 American Cinema  3 Credit Hours
This course will analyze how Hollywood as the nation's dream factory has manufactured fantasies and cultural myths that have constructed the image of American citizenship, both for Americans and non-Americans. It will establish the ideological function of Hollywood texts as providing unifying symbols for a fragmented society. (YR)
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or FILM 248
family, and mental health systems all have detailed legal environments of various institutional sectors in our society. The health care, the The Law and Society field takes up studies of the legal environment rights.

of criminals, constitutional interpretation and the enunciation of citizen

human freedoms and civil rights, social responsibility and the treatment

emphasis is given to the study of such contemporary legal issues as

institution shaped by historical forces and social values. Substantively,

our contemporary day, students are encouraged to see law as a dynamic

contexts. Through study of the evolution of law from ancient societies to

is intended for the understanding of law in its historical and social

is available only to students with substantial practical experience in the

field of journalism or screen studies, and requires the approval of the

JASS faculty. This course is available only to Junior/Senior students

majoring in the JASS program.

Prerequisite(s):
JASS 2015 and JASS 248 and JASS 310

Restriction(s):
Can enroll if Class is Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Law and Society

Minor or Integrative Studies Concentration only

The Law and Society Minor/Concentration is a program of study that is intended for the understanding of law in its historical and social contexts. Through study of the evolution of law from ancient societies to our contemporary day, students are encouraged to see law as a dynamic institution shaped by historical forces and social values. Substantively, emphasis is given to the study of such contemporary legal issues as human freedoms and civil rights, social responsibility and the treatment of criminals, constitutional interpretation and the enunciation of citizen rights.

The Law and Society field takes up studies of the legal environment of various institutional sectors in our society. The health care, the family, and mental health systems all have detailed legal environments setting standards for professional conduct, responsibilities of various participants and enabling legislation of various kinds. Other fields, such as communications media, business enterprises, and the military also have fully elaborated legal environments.

Minor or Integrative Studies Concentration Requirements

The Law and Society Minor/Concentration is structured as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>Two Prerequisites</td>
<td></td>
<td></td>
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<tr>
<td>PHIL 240</td>
<td>Ethics</td>
<td>3</td>
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<tr>
<td>Select one course from:</td>
<td></td>
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</tr>
<tr>
<td>PHIL 233</td>
<td>Critical Thinking</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 234</td>
<td>Symbolic Logic</td>
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<tr>
<td>or PHIL 350</td>
<td>Symbolic Logic</td>
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<tr>
<td>Core Course</td>
<td></td>
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</tr>
<tr>
<td>SOC/CRJ 453</td>
<td>Sociology of Law</td>
<td>3</td>
</tr>
<tr>
<td>Four Track Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select two from Group A and two from Group B:</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Group A: Legal environments of industries and professions (CABL):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JASS 302</td>
<td>Media Law and Ethics</td>
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<tr>
<td>JASS/STS 403</td>
<td>Issues in Cyberspace</td>
<td></td>
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<tr>
<td>ENST/POL 445</td>
<td>Environmental Law</td>
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<tr>
<td>PHIL/HHS/ LIBS 442</td>
<td>Medical Ethics</td>
<td></td>
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<tr>
<td>POL/HHS 364</td>
<td>Health Pol and Administration</td>
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<tr>
<td>SOC 454</td>
<td>Mental Health and the Law</td>
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<tr>
<td>SOC/HHS 456</td>
<td>Health Care and the Law</td>
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<tr>
<td>SOC 457</td>
<td>Family, Aging and the Law</td>
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<td>PED 425</td>
<td>Educator and the Law</td>
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<tr>
<td>ACC 360</td>
<td>Federal Income Taxation</td>
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<tr>
<td>HRM 408</td>
<td>Legal Issues in Human Resource</td>
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<tr>
<td>LE 452</td>
<td>The Legal Environment of Bus</td>
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<tr>
<td>LE 453</td>
<td>Business Law: Advanced Topics</td>
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<tr>
<td>Group B: Structure and process of legal institutions (CABS):</td>
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<tr>
<td>CRJ 471</td>
<td>Int’l Criminal Justice Systems</td>
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<tr>
<td>ECON/ AAAS 325/ WGST 326</td>
<td>Economics of Pov and Discrm</td>
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<tr>
<td>ECON 385</td>
<td>Public Choice</td>
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<td>ECON 433</td>
<td>Antitrust and Regulation</td>
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<tr>
<td>ECON 4021</td>
<td>Economics of the Labor Sector</td>
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<tr>
<td>ECON 4085</td>
<td>Public Finance</td>
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<tr>
<td>PHIL/CRJ 335</td>
<td>Philosophy of Law</td>
<td></td>
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<tr>
<td>PHIL/CRJ 445</td>
<td>Contemporary Ethical Issues</td>
<td></td>
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<tr>
<td>POL 304</td>
<td>American Political Thought</td>
<td></td>
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<tr>
<td>POL 312</td>
<td>Legislative Process</td>
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<tr>
<td>POL 315</td>
<td>The American Presidency</td>
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<tr>
<td>POL/CRJ 316</td>
<td>The American Judicial Process</td>
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<tr>
<td>POL/CRJ/ WGST 362</td>
<td>Women, Politics, and the Law</td>
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<tr>
<td>POL 363</td>
<td>Cr Just Policy and Admin</td>
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</tbody>
</table>
Leadership & Communication in Organizations

The minor/concentration in Leadership and Communication in Organizations provides interdisciplinary study of the leadership of organizations, preparing students to critically assess the effectiveness of leaders in a wide range of organizations including business, government, and non-profit. The minor also prepares students to be more effective leaders in their careers and as citizens.

Minor or Integrative Studies
Concentration Requirements

15 credits of upper level course work. Include courses from three areas as indicated:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>15</td>
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</tbody>
</table>

### Communication Skills (CACB)

Select two courses from:

- COMM/ENGL 317 Case Studies in Tech Writing
- COMM 340 Professional Communication
- COMM 430 International Communications
- COMM 450 Principle of Organization Communication
- COMM 460 Public Relations Campaigns
- SPEE 310 Interpersonal Communication
- SPEE 320 Public Argument and Advocacy
- SPEE 330 Argumentation and Debate
- SPEE 340 Persuasion & Social Movements
- SPEE 430 Small Group Communication

### Leadership Studies (CALB)

Select one course from:

- HIST/WGST 3651 Women Leadership/Social Change
- COMM 477 Prof Communication Ethics
- BA 330 Managerial Communication
- PSYC 422 Psychology of Leadership

### Dimensions of Organizational Behavior (CADO)

Select two courses from:

- OB 354 Behavior in Organization
- MKT 360 Marketing and Society

### LGBTQ Studies

The LGBTQ Studies Certificate prepares students to work and live in our diverse world by concentrating on forms of sexual orientation, gender identity, and gender expression that are frequently left out of traditional fields of study.

The interdisciplinary approach of the certificate provides students with analytical frameworks for understanding how social, cultural, legal, and political factors influence the lives of LGBTQ individuals, families, and communities. The program of study examines a broad spectrum of diversity to foreground ways that sexuality and gender intersect with race, ethnicity, class, age, religion, disability, and nationality in people's lives.

The LGBTQ Studies Certificate can complement your major or stand alone as a post-baccalaureate credential.

Knowledge of LGBTQ issues and competency in serving gender and sexually diverse populations is relevant to many different fields, from education, law, and healthcare to business, counseling, and social work, among others. We warmly welcome students from all colleges as well as community members to participate in the program.

Students who complete the Certificate in LGBTQ Studies should expect to achieve the following:

1. Knowledge about the history and current issues facing LGBTQ individuals, families, and communities;
2. Knowledge about modes of resistance and community responses to these issues;
3. Familiarity with major concepts and methods in the fields of lesbian, gay, bisexual, transgender, and queer studies;
4. Ability to analyze the ways that sexual orientation and gender identity intersect with race, ethnicity, class, age, religion, disability, and nationality in people's lives;

5. Ability to apply theory to practice through research, creative production, practicum experience, and/or advocacy.

Certificate Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WGST/HUM/SOC 366</td>
<td>Sexualities, Genders, &amp; Bodies</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 3 classes from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIBS 139</td>
<td>Crossing Boundaries</td>
<td></td>
</tr>
<tr>
<td>WGST/SOC 388</td>
<td>LGBTQ Religious Experience</td>
<td></td>
</tr>
<tr>
<td>WGST/ANTH 406</td>
<td>Culture and Sexuality</td>
<td></td>
</tr>
<tr>
<td>WGST 408</td>
<td>Sex, Gender and the Body</td>
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<tr>
<td>WGST/ANTH/ SOC 451</td>
<td>Family, Sexuality, Rights</td>
<td></td>
</tr>
<tr>
<td>WGST/ENGL 471</td>
<td>LGBTQ Literature</td>
<td></td>
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<tr>
<td>WGST/ENGL 486</td>
<td>Queer Theory &amp; Literature</td>
<td></td>
</tr>
<tr>
<td>WGST 499</td>
<td>Independent Studies (approved contract required)</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 12

Notes:

1. A minimum 2.0 cumulative GPA is required for admission to the program.
2. A maximum of one course may be taken as pass/fail.
3. A maximum of one transfer course (three credit hours) may count toward the certificate.
4. A maximum of nine credits may share with the declared major.
5. Any LGBTQ related CASL internship may count in the certificate with permission of the LGBTQ Program Director by Petition.
6. A minimum 2.5 GPA in the courses counting toward the certificate is required at the time of graduation and/or posting of the certificate.

Linguistics

The scientific discipline of linguistics emerged in the twentieth century.

It is distinguished from earlier approaches to language chiefly by its focus on spoken and signed language as well as written, and by its emphasis on describing actual language as it is used rather than prescribing what is correct and proper. In pursuing these aims a set of rigorous methods and an extensive technical vocabulary have been devised. Spoken language is a complex system of organized sound, and any adequate analysis requires precision and detail at several levels.

UM-Dearborn Linguistics faculty focus on sociolinguistics and the structure, history, and social functions of the English language in contact with other languages, drawing on the methods and theoretical insights of the World Englishes approach.

Minor or Integrative Studies Concentration Requirements

Students may earn a minor in Linguistics or have Linguistics as a concentration for the Integrative Studies major by completing 12 credit hours of upper-level courses in Linguistics (LING).

For Language Arts for Elementary Education please follow the link here (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/undergraduate-degree-programs/elementary-k-8-certification-program/).

For English with Secondary Education Certification, please follow the link here (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/undergraduate-degree-programs/secondary-grades-6-12-certification/).

Students majoring in Language Arts Education and English with Secondary Education are required to take:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prequisite</td>
<td>LING 280 Introduction to Linguistics 1</td>
<td>3</td>
</tr>
<tr>
<td>Required</td>
<td>LING/ENGL 461 Modern English Grammar</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>LING/ENGL 482 History of the English Lang</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>One additional LING elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 12

1 Is the prerequisite for both of these courses and covers material examined in the Michigan State Teacher Certification Examination.
For ESL Endorsement Certificate, please follow the link here (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/undergraduate-degree-programs/secondary-grades-6-12-certification/).

Students in the English as a Second Language (ESL) Endorsement Program are required to take 15 credit hours of linguistics courses, including three required and two electives.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LING 476/576</td>
<td>Sociolinguistics</td>
<td>3</td>
</tr>
<tr>
<td>LING 474/574</td>
<td>Second Lang Acquisition: Engl</td>
<td>3</td>
</tr>
<tr>
<td>LING 480/580</td>
<td>Concepts in Linguistics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select two from the following: 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LING 461/ ENGL 561</td>
<td>Modern English Grammar</td>
<td></td>
</tr>
<tr>
<td>LING 482/ ENGL 582</td>
<td>History of the English Lang</td>
<td></td>
</tr>
<tr>
<td>LING 484</td>
<td>World Englishes</td>
<td></td>
</tr>
<tr>
<td>LING 425/ ANTH 525</td>
<td>Language and Society</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**LING 180  Text & Talk  3 Credit Hours**
An overview of fundamental language issues about which non-specialists are generally curious but often misinformed. Separate modules will deal with the origin and development of language, the importance of linguistic structures, the relationship between language and society with a focus on gender issues, and mental aspects of language, including bilingualism. Commonly-held misconceptions about speaking and writing will be critically examined by comparing and contrasting language myths and facts, placing strong emphasis on practices of reasearching, writing, and speaking about language issues in an academic setting. (OC)

**LING 280  Introduction to Linguistics  3 Credit Hours**
The basic concepts, scope, and methodology of the descriptive and historical study of the English language. (F,W,S).

**LING 281  Language, Thought, and Culture  3 Credit Hours**
A practical application of linguistic principles to many aspects of human behavior. Some of the topics covered will be language and thought, first and second language acquisition, social dialects, and reading. (OC).

**LING 375  Psychology of Language  3 Credit Hours**
The nature of human language as seen from the perspective of experimental psychology. The course introduces the student to current developments in linguistic theory. (OC).
**Prerequisite(s):** PSYC 171 or PSYC 170 or LING 280 or PSYC 101

**LING 383  American English  2 to 3 Credit Hours**
The development of American English and its dialects interpreted in the light of cultural history and processes of language change.
**Prerequisite(s):** LING 280 or LING 281

**LING 385  Language and Gender  3 Credit Hours**
Examines theories of differences between male and female speakers of English, focusing on phonological, syntactic, semantic, stylistic, and conversational features, with analyses of differences in speaking strategies and agendas of male and female speakers, as well as split-gender language situations in the workplace, home, and social settings.
**Prerequisite(s):** LING 280 or LING 281

**LING 388  Language Pathologies  3 Credit Hours**
A survey of language pathologies, spoken and written; production and reception; primary and secondary (those arising from other medical dysfunctions: stroke, muscular dystrophy, multiple sclerosis, cerebral palsy, cleft, deafness). Attention to pathologies related to psychoses and neurological disorders. (AY).
**Prerequisite(s):** LING 280 or LING 281

**LING 390  Topics in Linguistics  3 Credit Hours**
Examination of problems and issues in selected areas of linguistics. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

**LING 391  Independent Study  3 Credit Hours**
***NO DESCRIPTION AVAILABLE***

**LING 399  Independent Studies in Ling  1 to 6 Credit Hours**
Readings or analytical assignments in linguistics in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor. May be repeated for a maximum of 6 credit hours. (F,W).

**LING 422  Language and Popular Culture  3 Credit Hours**
This course provides an overview of popular culture theories and communication models along with research methods. It offers an accessible, in-depth presentation of popular culture including music, film, television, magazines, comics, animation, and advertising in the US and the beyond. The main focus of the course is to highlight the functions of language, particularly, dialects, accents, and foreign languages, in producing and consuming local and global pop culture texts.
**Restriction(s):**
Can enroll if Level is Undergraduate

**LING 425  Language and Society  3 Credit Hours**
An examination of the social functions of speech through readings and exercises, emphasizing schools and other applied settings. Topics include ethnic and social class dialects, codeswitching, and the organization of conversation. Students cannot receive credit for both LING 425 and LING 525. (YR).
**Prerequisite(s):** ANTH 101 or LING 280 or LING 281

**LING 461  Modern English Grammar  3 Credit Hours**
The morphological and syntactic analysis of the structure of present day English considered in the light of modern linguistic science. Students cannot receive credit for both LING 461 and LING 561.
**Prerequisite(s):** LING 280 or LING 281 or LING 480

**LING 464  Contemporary Rhetorical Theory  3 Credit Hours**
An examination of contemporary rhetorical theories through study of representative practitioners and related developments in linguistics, philosophy, psychology, communication, and composition and rhetoric. Students may not receive credit for both LING 464 and LING 564.
**Prerequisite(s):** COMM 220 or COMM 250 or COMM 260 or COMM 280 or COMM 290 or ENGL 200 or ENGL 223 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 248 or ENGL 250
**Restriction(s):**
Cannot enroll if Class is Graduate
LING 465 Discourse Analysis 3 Credit Hours
An examination of the syntactic and semantic devices and structures underlying communication in written texts and oral interaction. Material to be analyzed will vary from term to term (technical reports, scholarly articles, newspaper stories) but examples will be drawn primarily from the written language. Students cannot receive credit for both LING 465 and LING 565. (OC).
Prerequisite(s): LING 280 or LING 281
Restriction(s):
Cannot enroll if Class is Graduate

LING 474 Second Lang Acquisition: Engl 3 Credit Hours
A survey of fundamental concepts and major concerns in the study of English as a Second Language (ESL). The course examines a variety of psycholinguistic and sociolinguistic issues related to second language acquisition (SLA), ranging from theoretical to pedagogical. A primary focus is on developmental patterns and cognitive processes of SLA and individual variation in ESL speakers in terms of their social motivations and learning strategies. Implications for practical concerns such as the ESL teaching profession, instructional materials and curriculum development will be addressed where relevant.
Prerequisite(s): LING 280 or LING 281 or LING 480

LING 475 Lang Diversity: Arab Amer Comm 3 Credit Hours
The study of the development, features, and significance of varieties of English in southeastern Michigan, with a focus on the Arab American community. A range of sociolinguistic approaches are explored and applied to the subject matter. Topics to be addressed include code switching, language shift and maintenance, style shifting, and the role of language in identity formation. Students cannot receive credit for both LING 475 and LING 575.
Prerequisite(s): LING 280 or LING 281 or LING 480

LING 476 Sociolinguistics 3 Credit Hours
An examination of sociolinguistic approaches to the issue of variation in language. Areas to be considered include ways of defining and constructing language, different types of language varieties, how variation is structured in language, the role of sociolinguistic variation in linguistic change, and the significance of linguistic acts of identity. (YR)
Prerequisite(s): LING 280 or LING 480
Restriction(s):
Cannot enroll if Class is Graduate

LING 477 African American English 3 Credit Hours
An examination of the structure, history and use of African-American English. Topics will include the pronunciation, grammar and vocabulary of African-American English, theories of origin, linguistic repertoire and code-switching in African-American communities, the Ebonics controversy, and the role of this variety in education and identity formation. Students cannot receive credit for both LING 477 and LING 577.
Prerequisite(s): LING 280 or LING 281 or LING 480
Restriction(s):
Can enroll if Level is Undergraduate

LING 480 Concepts in Linguistics 3 Credit Hours
An examination of foundational concepts in linguistic and sociolinguistic theory, which explores the intellectual and philosophical problems raised by these concepts. Issues covered include the metalinguistic nature of language studies, the relation of language to the communication systems of other species, the physiological basis of language, language variation, language function and instrumentality, and innate versus learned behavior. Designed for students pursuing the Endorsement in ESL Teaching. (YR)
Prerequisite(s): LING 280 or LING 480
Restriction(s):
Cannot enroll if Class is Graduate

LING 482 History of the English Lang 3 Credit Hours
A thorough grounding in the history and structure of the English language. At issue are the linguistic and ideological origins of the concept of Standard English, and the strengths and limitations of different methods of analyzing the history of the language. The course will emphasize sound change, grammatical change, and their sociolinguistic context. (YR)
Prerequisite(s): LING 280 or LING 480
Restriction(s):

LING 484 World Englishes 3 Credit Hours
A study of the origin and significance of different forms of English throughout the world. Contact with other languages, pidginization, creolization, standardization, and the formation of the three circles of English are examined. (YR)
Prerequisite(s): LING 280 or LING 480
Restriction(s):

LING 490 Topics in Linguistics 3 Credit Hours
Examination of problems and issues in selected areas of linguistics. Titles as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

LING 499 Advanced Independent Studies 1 to 3 Credit Hours
Advanced research project in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor.
Prerequisite(s): LING 280 or LING 480

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Mathematics
Mathematics is one of the most precise and versatile human languages.

With it, mathematical scientists have described and understood complex physical phenomena, supported the infrastructure of the internet era, optimized production in industrial processes, and cultivated the creativity of young minds. As a language, together with its axiomatic underpinnings, mathematics is also a much-explored structure in itself. In recent decades, the boundary between pure and applied mathematics has dissolved, and training in both is important for every mathematician. The 21st century, with its growing importance of big data and computation, offers many opportunities to mathematicians.
The Department of Mathematics and Statistics offers a B.A. / B.S. degree in Mathematics, minors in Mathematics or in Computer and Computational Mathematics and a certificate in Mathematics for Finance. Mathematics Education courses are also available.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language I and II</th>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient Greek I and II</td>
<td>MCL 105 and MCL 106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisites to the Major**

Students desiring to major in mathematics are required to have successfully completed:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 216</td>
<td>Intro to Diff Equations</td>
<td>3-4</td>
</tr>
<tr>
<td>or MATH 228</td>
<td>Diff Eqs with Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM 172</td>
<td>Computing Environ for Math</td>
<td>3-4</td>
</tr>
<tr>
<td>CIS/CCM 150</td>
<td>Computer Science I</td>
<td></td>
</tr>
<tr>
<td>or CIS 1501</td>
<td>CS I for Data Scientists</td>
<td></td>
</tr>
</tbody>
</table>

**Major Requirements**

A total of at least 33 credit hours of coursework must be elected in mathematics (MATH) and cognate areas at the upper level (300-400 level courses). Students are required to elect 27 hours of coursework in mathematics (MATH) including:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 300</td>
<td>Math Lang Proof &amp; Struct</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses chosen in accordance with one of the following options: 12 Algebra Option or Analysis Option:

**Algebra Option:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 412</td>
<td>First Course in Modern Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 413</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Advanced Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

Select at least one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 452</td>
<td>Advanced Calculus II</td>
<td></td>
</tr>
<tr>
<td>MATH 492</td>
<td>Introduction to Topology</td>
<td></td>
</tr>
</tbody>
</table>

**Analysis Option:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 412</td>
<td>First Course in Modern Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Advanced Calculus I</td>
<td></td>
</tr>
<tr>
<td>MATH 452</td>
<td>Advanced Calculus II</td>
<td></td>
</tr>
</tbody>
</table>

or MATH 492 Introduction to Topology

Select at least one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 331</td>
<td>Survey of Geometry</td>
<td></td>
</tr>
<tr>
<td>MATH 395</td>
<td>Elementary Number Theory</td>
<td></td>
</tr>
<tr>
<td>MATH 413</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 455</td>
<td>Func of a Complex Var with App</td>
<td></td>
</tr>
</tbody>
</table>

**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language I and II</th>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>German I and II</td>
<td>GER 101 and GER 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latin I and II</td>
<td>LAT 101 and LAT 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish I and II</td>
<td>SPAN 101 and SPAN 102</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Applied Courses
Select at least two applied mathematics courses (CADM): 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 315</td>
<td>Applied Combinatorics</td>
<td></td>
</tr>
<tr>
<td>MATH 325</td>
<td>Probability</td>
<td></td>
</tr>
<tr>
<td>MATH 372</td>
<td>Computing with Mathematica</td>
<td></td>
</tr>
<tr>
<td>MATH 396</td>
<td>Introduction to Cryptography</td>
<td></td>
</tr>
<tr>
<td>MATH 404</td>
<td>Dynamical Systems</td>
<td></td>
</tr>
<tr>
<td>MATH 420</td>
<td>Stochastic Processes</td>
<td></td>
</tr>
<tr>
<td>MATH 425</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 454</td>
<td>Fourier and Boundary</td>
<td></td>
</tr>
<tr>
<td>MATH 455</td>
<td>Func of a Complex Var with App</td>
<td></td>
</tr>
<tr>
<td>MATH 458</td>
<td>Introduction to Wavelets</td>
<td></td>
</tr>
<tr>
<td>MATH 462</td>
<td>Mathematical Modeling</td>
<td></td>
</tr>
<tr>
<td>MATH 472</td>
<td>Intro to Numerical Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 473</td>
<td>Matrix Computation</td>
<td></td>
</tr>
<tr>
<td>MATH 523</td>
<td>Linear Algebra w/Applications (Program Adviser approval required)</td>
<td></td>
</tr>
</tbody>
</table>

Math Electives
Any two other MATH courses numbered 300 through 499 approved for Mathematics majors (excluding MATH 363, 385, 386, 387, 391, 442, 443, 444, 445, 446, 447, 449, 486). 6

Cognates
Select 6 credits upper level (300/400 and 3000/4000) from the following: 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM (including CHEM 225 and CHEM 226)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CIS (including CIS 200 and CIS 290)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ECE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 305</td>
<td>Economic Statistics</td>
<td></td>
</tr>
<tr>
<td>ECON 4015</td>
<td>Introduction to Econometrics</td>
<td></td>
</tr>
<tr>
<td>IMSE (except IMSE 334)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHIL 350</td>
<td>Symbolic Logic</td>
<td>2</td>
</tr>
<tr>
<td>PHIL/STS 485</td>
<td>Philosophy of Science</td>
<td></td>
</tr>
<tr>
<td>PHYS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT (Only one of STAT 301, STAT 325 can be used to satisfy this requirement)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 33

1. Courses joined with “and” count together as one course.
2. Cannot receive credit for both PHIL 234 and PHIL 350. PHIL 234 cannot be used in Cognates.

Notes:
1. Students who wish to use graduate-level courses, numbered 500 or higher, as part of the 27 credit hours of upper-level MATH coursework required for the major, must submit a Petition to obtain the approval of the faculty Program Advisor in Mathematics.
2. Students seeking secondary teacher certification must take MATH 331, MATH 486, EDD 450 and EDD 451. Also, MATH 395 and a course in statistics (STAT) are recommended for such students. None of the following MATH courses may be used to fulfill any requirements of either a Mathematics major or a Mathematics minor.

3. Applied Statistics courses (STAT) cannot be used to fulfill the Math major or minor/concentration requirements.
4. At least 12 of the 27 upper level credit hours in mathematics (MATH) must be elected at UM-Dearborn in order to graduate.
5. In order to enroll in a mathematics class, a student must have earned a grade of at least C- in all prerequisite mathematics courses; a grade below C- signals that the student should immediately repeat the class in order to build a stronger foundation for subsequent study. The same principle applies when a mathematics course is a prerequisite for courses of other disciplines.

Credit by Examination
The department grants credit for Calculus I to those students who have received a score of three, four, or five on the AB Exam or a score of three on the BC Exam of the Advanced Placement Program Tests of the College Entrance Examination Board. Credit is granted for both Calculus I and Calculus II to those students who have received a score of four or five on the BC Exam of the Advanced Placement Program Tests. In each case, the student is then eligible to elect the next calculus course in the calculus sequence.

Minor or Integrative Studies Concentration Requirements
A minor or concentration consists of 12 credit hours in mathematics (MATH) courses approved for upper-level credit in the mathematics major. (Excluding MATH 385, 386, 387, 391, 442, 443, 444, 445, 446, 447, 449, 486).
MATH 080 Introductory Algebra 3 Credit Hours
The Developmental Mathematics sequence (MATH 080, MATH 090) is offered as a service to students who need extra preparation in mathematics. MATH 080 is for students who are likely to need two semesters of additional preparation in mathematical computation and symbol manipulation, communication, and conceptual understanding. Topics in the two-course sequence include: arithmetic readiness, real numbers and expressions, linear equations and inequalities, lines and functions, systems of linear equations, rational expressions and equations, radicals and complex numbers, quadratic equations and functions, function operations and inverses. Students are required to have Internet-ready devices available for each class meeting. Skill development takes place online and outside scheduled class meetings. The course is graded on an A, B, C, NC (not completed) basis. This course is offered for additive credit.
Prerequisite(s): Mathematics Placement with a score of 080

MATH 090 Intermediate Algebra 3 or 6 Credit Hours
The Developmental Mathematics sequence (MATH 080, MATH 090) is offered as a service to students who need extra preparation in mathematics. MATH 090 is for students who (1) have successfully completed MATH 080 or (2) are likely to require only one semester of additional preparation in mathematical computation and symbol manipulation, communication, and conceptual understanding. Topics in the two-course sequence include: arithmetic readiness, real numbers and expressions, linear equations and inequalities, lines and functions, systems of linear equations, rational expressions and equations, radicals and complex numbers, quadratic equations and functions, function operations and inverses. Students are required to have Internet-ready devices available for each class meeting. Skill development takes place online and outside scheduled class meetings. The course is graded on an A, B, C, NC (not completed) basis. This course is offered for additive credit.
Prerequisite(s): MATH 080 or Mathematics Placement with a score of 090

MATH 104 College Algebra 4 Credit Hours
Primary purpose of this course is to prepare students for success in MATH 113. Topics include equations and inequalities, linear, quadratic, polynomial, rational, logarithmic and exponential functions along with their graphs; application of these functions, systems of linear inequalities. This course does not cover trigonometric functions and cannot be used as a prerequisite for MATH 115. Students electing this course should have at least taken two years of High School Algebra and one year of High School Geometry or MATH 090. Students cannot receive credit for both MATH 104 and MATH 105. (F, W, S)
Prerequisite(s): MATH 090 or Mathematics Placement with a score of 105

MATH 1045 Trigonometry 2 Credit Hours
The primary purpose of this course is to prepare students to take Math 115 (Calculus I) after successfully completing MATH 104 (College Algebra). It also meets students' demand to refresh or enhance their Trigonometry knowledge. Topics to be covered include: Trigonometric Functions, Acute Angles and Right Triangles, Radian Measure and the Unit Circle, Trigonometric identities, Inverse Circular Functions and basics of Functions. (YR)
Prerequisite(s): MATH 104

MATH 105 Pre-Calculus 4 Credit Hours
Primary purpose of this course is to prepare students for success in Calculus. Topics include equations and inequalities; linear, quadratic, polynomial, rational, logarithmic, exponential and trigonometric functions along with their graphs; application of these functions. Students electing this course should have taken at least two years of High School Algebra and one year of High School Geometry or MATH 090. Students cannot receive credit for both MATH 104 and MATH 105. (F.W.S)
Prerequisite(s): MATH 090 or Mathematics Placement with a score of 105

MATH 113 Calc I for Biology & Life Sci 4 Credit Hours
This course develops basic concepts of Calculus from the perspectives of Biology and Life Sciences. Topics include differential and integral calculus of algebraic/logarithmic/exponential functions of one variable, limits, continuity, differentiation, integration, graphing, optimization, related rates and area. Applications include modeling biological problems of medicine, genetics, Biomechanics, ecology, population growth and decay. (This course does not fulfill the calculus requirements for concentration in chemistry, physics, biochemistry, engineering, or mathematics) Student cannot receive credit for both Math 113 and Math 115.
Prerequisite(s): MATH 105 or MATH 104 or Mathematics Placement with a score of 115

MATH 114 Calc II for Biology & Life Sci 4 Credit Hours
The topics of this course include advanced methods of integration (integration by parts, partial fraction), modeling with differential equations, some elementary differential equations, matrix algebra, systems of linear equations using matrix method, introduction to probability, conditional probability, discrete and continuous random variables (exponential and normal random variables). Problems in biology, medicine and physiology are used to illustrate how computation and mathematics can improve and enhance the understanding of these problems. Students cannot receive credit for both Math 114 and Math 116.
Prerequisite(s): MATH 113 or MATH 115 or Mathematics Placement with a score of 116

MATH 115 Calculus I 4 Credit Hours
Functions and their graphs; limits and continuity of functions, differentiation, algebraic and trigonometric functions, applications of derivatives, definite and indefinite integrals, and applications of definite integral. This course includes computer labs. Students cannot receive credit for both MATH 113 and MATH 115. (F,W,S).
Prerequisite(s): MATH 105 or (MATH 104 and MATH 1045) or Mathematics Placement with a score of 115

MATH 116 Calculus II 4 Credit Hours
Transcendental functions, techniques of integration, improper integral, infinite sequences and series, Taylor's theorem, topics in analytic geometry, polar coordinates, and parametric equations. This course includes computer labs. Students cannot receive credit for both MATH 114 and MATH 116. (F,W,S).
Prerequisite(s): MATH 115 or Mathematics Placement with a score of 116
MATH 131  Conceptual Mathematics  4 Credit Hours
The purpose of Math 131 is to develop an awareness of the use of mathematics in the world around us. Students are encouraged to understand organizational tools of mathematics, including set theory and the use of deductive logic. Areas of application may include: consumer Mathematics, Probability, Statistics, social decision making, apportionment, graph theory, and mathematical modeling. Students intending to elect this course should have taken the equivalent of one year of high school algebra and one year of high school geometry. This course is not open to mathematics concentrators. (F,W,S).

MATH 205  Calc III for Engr Students  3 Credit Hours
Vectors in the plane and space, topics from multivariable calculus including partial differentiation and multiple integration, with an emphasis on applications, and line integrals and Green's theorem. This course includes computer labs. Students cannot receive credit for both MATH 205 and MATH 215. (F,W,S).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 215  Calculus III  4 Credit Hours
Vectors in the plane and space, vector-valued functions and curves, functions of several variables including limits, continuity, partial differentiation and the chain rule, multiple integrals and coordinate transformations, integration in vector fields, and Green's and Stokes' theorems. This course includes computer labs. Students cannot receive credit for both MATH 205 and MATH 215. (F,W).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 216  Intro to Diff Equations  3 Credit Hours
Prerequisite(s): MATH 116

MATH 217  Intro to Matrix Algebra  2 Credit Hours
Systems of equations, matrices, determinants, the n-dimensional real vector spaces, orthonormal basis, linear transformations, and eigenvalues and eigenvectors. Students cannot receive credit for both MATH 217 and MATH 227. (F,W,S).
Prerequisite(s): MATH 114 or MATH 116 or Mathematics Placement with a score of 215

MATH 227  Introduction to Linear Algebra  3 Credit Hours
An introduction to the theory and methods of linear algebra with matrices. Topics include: systems of linear equations, algebra of matrices, matrix factorizations, vector spaces, linear transformations, eigenvalues and eigenvectors, science and engineering applications, and computational methods. Students cannot receive credit for both MATH 227 and MATH 217. (F,W,S).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 228  Diff Eqs with Linear Algebra  4 Credit Hours
Full Title: Differential Equations with Linear Algebra This course provides an introduction to ordinary differential equations. Emphasis is placed on the development of abstract concepts and applications for first-order and linear higher-order differential equations, systems of differential equations, introductory numerical methods, matrix algebra, and Laplace transform techniques. Students cannot receive credits for both MATH 228 and MATH 216 and MATH 217 (F,W,S).
Prerequisite(s): MATH 116

MATH 276  Discrete Math Meth Comp Gr Engr  4 Credit Hours
An introduction to fundamental concepts of discrete mathematics for computer engineering. Topics will be chosen from: set theory, partially ordered sets, lattices, Boolean algebra, semi-groups, rings, graphical representation of algebraic systems, graphs and directed graphs. Applications in various areas of computer engineering will be discussed. (F,W,S).
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215

MATH 297  The Nature of Mathematics  3 Credit Hours
Mathematics will be presented in a way so that Honors Program students (including nonscience majors) can learn what makes mathematics a fascinating field of study rather than a collection of dry formulas. A few “Great Theorems” will be studied in their historical context, interconnections between mathematics and science will be studied, and some famous personalities will be presented. Open only to students in the CASL Honors Program.

MATH 300  Math Lang Proof & Struct  3 Credit Hours
A required course for students completing a Mathematics concentration, this course is also a prerequisite for many upper-level Mathematics courses. The course focuses on developing the following: an understanding of, and facility with, the logic and syntax of mathematical statements; and ability to recognize and propose appropriate strategies and outlines for proving given statements; facility in writing mathematical proofs; a knowledge base/toolbox of foundational material including basic concepts and terminology related to naive set theory.
Prerequisite(s): MATH 217 or MATH 227

MATH 315  Applied Combinatorics  3 Credit Hours
An introduction to methods and applications of enumerative and configurational combinatorics. Students study several elegant and useful techniques for counting and/or generating the elements in large and unwieldy finite sets. Students will also study topics in graph theory that are applicable to real world problems. Topics include basic counting principles, the principle of inclusion-exclusion, generating functions and recurrence relations. Topics from graph theory include graph models, paths, circuits, cycles, connectedness; additional topics include the theory and applications of planarity, coloring, directed graphs, and networks and network flows.
Prerequisite(s): (MATH 200 or MATH 300) and (MATH 227 or MATH 217)

MATH 325  Probability  3 Credit Hours
Brief overview of summary and display of data, probability concepts, discrete and continuous random variables and associated probability models, expectation, independent random variables, probability generating functions and moment generating functions, sampling distributions, the central limit theorem, the t-distribution, properties of estimators, and interval estimation. Previously taught as Mathematical Statistics I. (F).
Prerequisite(s): MATH 114 or MATH 116

MATH 331  Survey of Geometry  3 Credit Hours
A development of Euclidean geometry as a formal axiom system and an introduction to non-Euclidean geometries and to Transformational Geometry. Geometric models and the history of geometry are stressed. Development of students’ geometric intuition as well as their ability to work in a formal axiom system are emphasized. (F).
Prerequisite(s): MATH 116 and (MATH 200 or MATH 300)
MATH 372  Computing with Mathematica  3 Credit Hours
The course explores a variety of topics from different areas of undergraduate mathematics including calculus, matrix algebra, number theory, geometry, and discrete mathematics. Students learn to design customized Mathematica functions to solve specific problems in these areas using the symbolic, computational, graphics and programming tools provided within Mathematica. (AY,W).
Prerequisite(s): MATH 217 or MATH 227

MATH 385  Math forElem Teachers I  3 Credit Hours
The purpose of this course and the Math 386 and Math 387 courses is to provide future teachers with foundational knowledge of mathematics they will teach. An inquiry approach is emphasized involving problem solving, problem posing, pattern seeking, reasoning, justification, representations, and communications. Topics in Math 385 include number theory, meaning of operations, the reasoning behind procedures, and the rational number system, including fractions and decimals. (F,W)
Restriction(s):
Can enroll if College is Education, Health, and Human Services

MATH 386  Math for Elem Teachers II  3 Credit Hours
The purpose of this course and the Math 385 and Math 387 courses is to provide future teachers with foundational knowledge of mathematics they will teach. An inquiry approach is emphasized involving problem solving, problem posing, pattern seeking, reasoning, justification, representations, and communications. Topics in Math 386 include number theory, proportional reasoning, the geometry of two-dimensional shape and measurement, integers, and the real number system. (F,W)
Prerequisite(s): MATH 385
Restriction(s):
Can enroll if College is Education, Health, and Human Services

MATH 387  Math for Elem Teachers III  3 Credit Hours
The purpose of this course and the Math 385 and Math 386 courses is to provide future teachers with foundational knowledge of mathematics they will teach. An inquiry approach is emphasized involving problem solving, problem posing, pattern seeking, reasoning, justification, representations, and communications. Topics in Math 387 include data analysis; probability; the geometry of three-dimensions including shape, spatial visualization, and measurement; geometric concepts of similarity and congruence; coordinate geometry; and transformational geometry. Algebraic reasoning is integrated throughout. (F,W)
Prerequisite(s): MATH 386
Restriction(s):
Can enroll if College is Education, Health, and Human Services

MATH 390  Topics in Mathematics  1 to 3 Credit Hours
A course designed to offer selected topics in different areas of mathematics. The specific topic or topics will be announced together with the prerequisites each term. Course may be repeated for credit when specific topics differ.

MATH 390E  Topics in Mathematics  3 Credit Hours
TOPIC TITLE: Preparation for Industrial Careers PIC Math prepares mathematical science students for industrial careers by engaging them in research problems that come directly from industry. A strong component of PIC Math involves students working as a group on a semester-long undergraduate research problem from business, industry, or government. Undergraduate research is a high impact teaching and learning practice and has been shown to improve students abilities in Problem solving. Critical thinking, Independent thinking, and Communicating.
Prerequisite(s): MATH 200 or MATH 205 or MATH 215 or MATH 216 or MATH 217 or MATH 227 or MATH 276

MATH 391  Topics in Mathematics Edu  1 to 3 Credit Hours
A course designed to offer selected topics in mathematics related to K-12 education. The specific topic or topics will be announced together with the prerequisites each term. Course may be repeated for credit when specific topics differ. (OC).

MATH 391B  Topics in Mathematics and Stat  1 to 3 Credit Hours
Topic: Number and Proportional Reasoning in Middle School Mathematics Teachers. This course is designed to deepen the teachers of middle school mathematics understanding of the rational number system and its extension to the real number system in a way that models appropriate pedagogy and raises curriculum issues relevant to teaching number concepts for conceptual understanding and computation fluency. A particular emphasis will be on understanding and applying concepts of proportional reasoning. Topics related to this emphasis include analyzing connections between fraction concepts and ratios and proportions; describing the relationship between proportions and direct and indirect variation; analyzing and applying the connections between proportions and similar figures, probability and sampling; and modeling and solving problems involving rations and proportions. Other major topics include analyzing number theoretic concepts such as prime numbers and divisibility; and comparing and contrasting models of operations across number systems. Calculator and computer technology will be used as problem solving tools and for support in conceptual understanding. Curriculum resources and materials that support conceptual understanding are considered.

MATH 395  Elementary Number Theory  3 Credit Hours
Properties of the integers, the division algorithm, Euclid's algorithm, Fermat's theorems, unique factorization of integers into primes, congruences, arithmetic functions, Diophantine equations, continued fractions, quadratic reciprocity. (W).
Prerequisite(s): MATH 205 or MATH 215

MATH 396  Introduction to Cryptography  3 Credit Hours
This course discusses ways of encrypting information, a function which is vital to economics, defense and the empowerment of society. It is more crucial now than ever before to be able to securely transfer information in this age of electronic communication. After discussing primitive ways of encrypting information and explaining the need for more sophisticated encoding methods, this course explores the mathematics (number theory, finite fields and probability) behind both historic and more recent cryptosystems that have been developed for the secure transmission of data along non secure channels. This course continues with symmetric and public key cryptosystems, elliptic curves, digital signatures, zero knowledge protocols and other more advanced methods. This course does not assume any prior knowledge of number theory or probability. (YR)
Prerequisite(s): MATH 205 or MATH 215 or MATH 216 or MATH 217 or MATH 227 or MATH 228 or MATH 276

MATH 399  Independent Studies in Math  1 to 3 Credit Hours
Independent study in mathematics for topics at the junior level. Topics and objectives chosen by agreement between student and instructor.
MATH 4000  Capstone in Mathematics  3 Credit Hours
Math 4000 is the Capstone course in Mathematics, covering an advanced topic in Mathematics determined by the instructor. Topics may include, but are not limited to, algebraic geometry, functional analysis, functions of several complex variables, and aspects of the study of numerical analysis, partial differential equations, combinatorics, probability, number theory, or topology. Students are expected to complete a research project in the area of the particular topic. (F, W)
**Prerequisite(s):** MATH 217 or MATH 227
**Restriction(s):**
Can enroll if Class is Junior or Senior

MATH 404  Dynamical Systems  3 Credit Hours
The aim of this course is to survey the standard types of differential equations. This includes systems of differential equations, and partial differential equations, including for each type, a discussion of the basic theory, examples of applications, and classical techniques of solutions with remarks about their numerical aspects. Also included are autonomous and periodic solutions, phase space, stability, perturbation techniques and Method of Liapunov. Students cannot receive credit for both MATH 404 and MATH 504. (AY).
**Prerequisite(s):** (MATH 216 or MATH 217 or MATH 228) and MATH 227

MATH 405  Integral Equations  3 Credit Hours
Origin and classification of integral equations, connections with differential equations, integral equations of convolution type, method of successive approximations, single kernels, elements of Hilbert space, linear operators, resolvents, Fredholm theory and Hilbert-Schmidt theory. Students cannot receive credit for both MATH 405 and MATH 505. (OC).
**Prerequisite(s):** MATH 216 and (MATH 217 or MATH 227)

MATH 412  First Course in Modern Algebra  3 Credit Hours
Introduction to groups, subgroups, group homomorphisms, factor groups, simple groups, cyclic groups, Sylow theorems, rings, ideals, integral domains, fields, polynomial rings, Kronecker’s theorem, also properties of the integer, rational, real, and complex numbers. Students cannot receive credit for both MATH 412 and MATH 512. (W).
**Prerequisite(s):** (MATH 200 or MATH 300) and (MATH 217 or MATH 227 or MATH 228)

MATH 413  Linear Algebra  3 Credit Hours
Vector spaces, linear transformations and matrices, determinants, inner product spaces, bilinear and quadratic forms, Hamilton-Cayley theorem, eigenvalues and eigenvectors, and spectral theorem. Students cannot receive credit for both MATH 413 and MATH 513. (F)
**Prerequisite(s):** (MATH 200 or MATH 300) and MATH 216 and (MATH 217 or MATH 227)

MATH 420  Stochastic Processes  3 Credit Hours
Review of distribution theory. Introduction to stochastic processes, Markov chains and Markov processes, counting, and Poisson and Gaussian processes. Applications to queuing theory. Students cannot receive credit for both MATH 420 and MATH 520. (AYW).
**Prerequisite(s):** MATH 217 or MATH 227

MATH 425  Mathematical Statistics  3 Credit Hours
Interval estimation and pivotal quantities, maximum likelihood estimation, hypothesis tests, linear models and analysis of variance, bivariate normal distribution, regression and correlation analysis, and nonparametric methods. Students cannot receive credit for both MATH 425 and MATH 525. Previously taught as Mathematical Statistics II. (AYS).
**Prerequisite(s):** MATH 325

MATH 435  Mathematics of Finance  3 Credit Hours
Full Course Title: Introduction to Mathematics of Finance This course teaches students to apply mathematical skills in finance. Topics covered include different types of interests, cash flows, present and future values, yield, probability, annuities, debts, stocks and bonds. (YR)
**Prerequisite(s):** MATH 325

MATH 442  Geometry for Teachers  3 Credit Hours
Properties of two and three-dimensional figures are covered, including congruence, symmetry, transformation, and measurement. Trigonometry from a geometric perspective and the use of trigonometry in problem solving are included. Topics also include coordinate geometry and visualization as well as the nature of axiomatic reasoning and the role it has played in the development of mathematics. An investigative approach involving problem solving, reasoning and proof, connections, and communication will be emphasized. Calculator and computer technology will support the investigation of these topics. Classroom resources and materials are considered. Different levels of geometric thinking will be explored. No credit for CASL concentration, minor, or area of focus. Open only to certified teachers or elementary education students. Student cannot receive credit for both MATH 442 and MATH 542.
**Prerequisite(s):** MATH 387
**Restriction(s):**
Cannot enroll if Level is
Can enroll if College is Education, Health, and Human Services

MATH 443  Algebra for Teachers  3 Credit Hours
Algebraic structure is emphasized, especially as it relates to arithmetic. Emphasis is on the development of algebraic reasoning and generalizations with the appropriate pedagogy. Curriculum issues relevant to teaching algebra for conceptual understanding are included. Major topics include algebraic representations of linear, exponential, power and quadratic patterns, systems of equations, and applications. An investigative approach involving problem solving, reasoning and proof, connections and communications will be emphasized. Classroom resources and materials are considered as well as calculators and computer technology as problem-solving tools to aid in algebraic thinking. No credit for CASL concentration, minor or area of focus. Students cannot receive credit for both MATH 443 and MATH 543. (F, W, S).
**Prerequisite(s):** MATH 386
**Restriction(s):**
Cannot enroll if Level is
Can enroll if College is Education, Health, and Human Services
MATH 444  Data Anlysys,Prob&Stat forTchrs  3 Credit Hours
Concepts of probability using both experimental and theoretical models
are considered with an emphasis on the use of probability models to
describe physical phenomena and to make and interpret predictions.
Topics in data analysis and statistics include drawing inferences from
visual displays of data, applying techniques of inferential statistics,
sampling and simulations to generate solutions to problems, and
making appropriate inferences using best fit techniques. Evaluating
data and arguments to establish validity, interpreting, calculating and
solving problems related to correlation, distributions, percentiles and
standard scores are also included. An investigative approach involving
problem solving, reasoning and proof, connections, and communication
will be emphasized. Calculator and computer technology will support
the investigation of these topics. No credit for CASL concentration,
minor, or area of focus. Open only to certified teachers or elementary
education students. Students cannot receive credit for both MATH 444
and MATH 544.
Prerequisite(s): MATH 387
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if College is Education, Health, and Human Services

MATH 445  Number & Prop'l Rsng for Tchrs  3 Credit Hours
This course deepens previous work on rational number ideas and
applications, and explores the concepts of ratio and proportion. Content
includes a variety of situations involving proportions, for example,
real-world problems involving ratios, rates, and percents, geometry
involving similarity, algebra involving linearity, probability involving
assigning a probability to an event, and trigonometry involving slope.
Distinguishing proportional situations from those that are not and
reasoning proportionally in appropriate situations are emphasized. The
course includes problem solving, reasoning and proof, connections,
communication, and multiple representations. No credit for CASL
concentration, minor, or area of focus. Open only to certified teachers or
elementary education students or by permission of instructor. Students
cannot receive credit for both MATH 445 and MATH 545. (AY).
Prerequisite(s): MATH 442 and MATH 443
Restriction(s):
Cannot enroll if Class is

MATH 446  Discrete Math/Modeling for Tch  3 Credit Hours
This course interweaves the ideas of discrete mathematics with the
approaches and strategies of mathematical modeling. It gives pre-
and inservice teachers opportunities to deepen their understanding
and use of mathematical models based on the concepts of discrete
mathematics. Topics include recurrence, induction, permutations,
combinations, binomial distributions, circuits, critical paths, minimal
spanning trees, adjacency matrices, algorithm design and optimization.
Systems thinking and multiple representations are emphasized. No credit
for CASL concentration, minor, or area of focus. Open only to certified
teachers or elementary education students. Students cannot receive
credit for both MATH 446 and 546. (AY).
Prerequisite(s): MATH 442 and MATH 443
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is

MATH 447  Micro in Math for Teachers  2 Credit Hours
Use of the microcomputer in the mathematics classroom with an
emphasis on the LOGO programming language. Problem solving, hands-
on activities, and a cooperative learning environment are emphasized.
Students cannot receive credit for both MATH 447 and MATH 547.
Prerequisite(s): MATH 385
Restriction(s):
Cannot enroll if Level is

MATH 449  Concepts of Calc for Teachers  3 Credit Hours
Concepts of Calculus for Teachers focuses on calculus concepts
appropriate for middle school mathematics teachers and teacher-
candidates. The course provides a deep understanding of the major
concepts of calculus: rates of change, accumulation (net change),
area, and limits. Students will experience concrete approaches to the
various topics using problem solving, manipulatives and technology as
appropriate, with the intent being to help the learners discover how the
ideas of calculus are useful in a variety of settings. Visual, numeric and
commonsense approaches are used. No credit for CASL concentration,
minor, or area of focus. Open only to certified teachers or elementary
education students. Students cannot receive credit for both MATH 449
and 549. (AY)
Prerequisite(s): MATH 442 and MATH 443

MATH 451  Advanced Calculus I  3 Credit Hours
Properties of the real number system; point set theory for the real line
including the Bolzano-Weierstrass theorem; sequences, functions of
one variable: limits and continuity, differentiability, Reimann integrability.
Students cannot receive credit for both MATH 451 and MATH 551. (F).
Prerequisite(s): (MATH 300 or MATH 200) and (MATH 216 or MATH 217
or MATH 228) and MATH 227

MATH 452  Advanced Calculus II  3 Credit Hours
Includes the rigorous study of functions of two and more variables,
partial differentiation and multiple integration. Special topics include:
Taylor Series, Implicit Function Theorem, Weierstrass Approximation
Theorem, Arzela-Ascoli Theorem. Students cannot receive credit for both
MATH 452 and MATH 552. (AY,W).
Prerequisite(s): MATH 451

MATH 454  Fourier and Boundary  3 Credit Hours
Fourier series and integrals. Their use in solving boundary value problems
of mathematical physics by the method of separation of variables. Sturm-
Liouville theory and generalized Fourier series, including those involving
Bessel functions and Legendre polynomials, with applications. Students
cannot receive credit for both MATH 454 and MATH 554. (F).
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227

MATH 455  Func of a Complex Var with App  3 Credit Hours
Complex number system. Functions of a complex variable, their
derivatives and integrals. Taylor and Laurent series expansions. Residue
theory and applications, elementary functions, conformal mapping, and
applications to physical problems. Students cannot receive credit for both
MATH 455 and MATH 555. (W).
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227
Restriction(s):
Can enroll if Level is Undergraduate
MATH 458  Introduction to Wavelets  3 Credit Hours
This course will introduce the students to theory and application of wavelets using linear algebra. Topics will include the discrete Fourier transform, the fast Fourier transform, linear transformations, orthogonal decomposition, discrete wavelet analysis, the filter bank, Haar Wavelet family, Daubechies's Wavelet family, and applications. Students cannot receive credit for both MATH 458 and MATH 558. (OC)
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227
Restriciton(s):
Can enroll if Class is Sophomore or Junior or Senior

MATH 462  Mathematical Modeling  3 Credit Hours
The processes of constructing, implementing, and evaluating mathematical models of "real world" phenomena are investigated. Models involving continuous and discrete mathematical constructs are considered. Deterministic and stochastic models are compared. Examples are taken from genetics, epidemiology, queueing theory, and other fields. Students cannot receive credit for both MATH 462 and MATH 562. (F).
Prerequisite(s): (MATH 216 or MATH 217 or MATH 228) and MATH 227

MATH 472  Intro to Numerical Analysis  3 Credit Hours
Solution of linear systems by Gaussian elimination, solution of non-linear equations by iterative methods, numerical solution of ordinary differential equations, data fitting with spline functions, numerical integration, optimization. Students cannot receive credit for both MATH 472 and MATH 572. (F).
Prerequisite(s): MATH 217 or MATH 227

MATH 473  Matrix Computation  3 Credit Hours
A study of the most effective methods for finding the numerical solution of problems which can be expressed in terms of matrices, including simultaneous linear equations, orthogonal projections and least squares, eigenvalues and eigenvectors, positive definite matrices, and difference and differential equations. Students cannot receive credit for both MATH 473 and MATH 573. (AY, W).
Prerequisite(s): MATH 217 or MATH 227

MATH 480  History of Mathematics  3 Credit Hours
A unified view of the rise of mathematics from ancient times to the present, as seen in its conceptual developments and developments, its major themes and its applications (including computers). Students cannot receive credit for both MATH 480 and MATH 580. (OC).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)

MATH 486  Sec School Math for Teachers  3 Credit Hours
Basic concepts, relationships, generalizations, and applications from the secondary school mathematics curriculum are discussed both from an advanced viewpoint and from the standpoint of the learner. Included are the roles of technology, problem solving, and current thinking on the teaching of secondary mathematics topics. Students cannot receive credit for both MATH 486 and MATH 586. (F).
Prerequisite(s): MATH 217 or MATH 227

MATH 492  Introduction to Topology  3 Credit Hours
Metric spaces, topological spaces, continuous maps, connectedness, compactness, separation axioms. Students cannot receive credit for both MATH 492 and MATH 592. (AY, W).
Prerequisite(s): MATH 451

MATH 499  Independent Studies in Math  1 to 3 Credit Hours
Independent study in mathematics for topics at the senior level. Topics and objectives chosen by agreement between student and instructor. (OC).

Mathematics for Finance

In the last two decades, financial markets and their impact on world economies have significantly increased their reliance on sophisticated mathematically based methods in assessing risk and implementing financial strategies.

These methods are rooted from the fields of probability, statistics and differential equations. The Mathematics for Finance Certificate provides students, with a strong mathematical background, the opportunity to gain the skills and knowledge to apply mathematics in solving problems arising in economics, finance and risk management.

Mathematics for Finance Certificate will:

- Teach students modern mathematical and computational skills motivated by applications in finance and economics.
- Expose the students to the mathematics of randomness with a rigorous but applied probability course.
- Prepare students for graduate programs in the field of Financial Mathematics.

Certificate Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 430</td>
<td>Applied Regression Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>STAT 325</td>
<td>Applied Statistics I</td>
<td></td>
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<tr>
<td>STAT 327</td>
<td>Statistical Computing</td>
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<tr>
<td>STAT 460</td>
<td>Time Series Analysis</td>
<td></td>
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<tr>
<td>STAT 305</td>
<td>Intro. to Data Science</td>
<td></td>
</tr>
<tr>
<td>MATH 425</td>
<td>Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 305</td>
<td>Intro. to Data Science</td>
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<tr>
<td>MATH 327</td>
<td>Statistical Computing</td>
<td></td>
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<tr>
<td>MATH 404</td>
<td>Dynamical Systems</td>
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<td>MATH 420</td>
<td>Stochastic Processes</td>
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<tr>
<td>MATH 462</td>
<td>Mathematical Modeling</td>
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<tr>
<td>MATH 472</td>
<td>Intro to Numerical Analysis</td>
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<tr>
<td>MATH 430</td>
<td>Applied Regression Analysis</td>
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<tr>
<td>MATH 451</td>
<td>Statistics, Stochastic Processes</td>
<td></td>
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<tr>
<td>STAT 440</td>
<td>Time Series Analysis</td>
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</tbody>
</table>

Total Credit Hours 12-13

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

MATH 435 cannot count toward the Mathematics major and the Mathematics for Finance Certificate.

NOTES REGARDING MATHEMATICS FOR FINANCE CERTIFICATE PROGRAM:
1. A minimum 2.5 cumulative GPA is required for admission to the program.
2. A minimum 3.0 GPA in the courses counting toward the certificate is required at the time of graduation and/or awarding of the certificate.
3. None of the courses applied to the certificate may be taken pass/fail.
4. No transfer coursework may be counted toward the program.
5. A maximum of 3 credits Independent Study may be counted toward the program and must be approved by Petition prior to completion the Independent Study.

**Medieval and Renaissance Studies**

Medieval & Renaissance Studies is cross-cultural in design and covers the time-period from Late Antiquity (ca. 400) to the seventeenth century. Through the interdisciplinary study of history, art, religion, language and literature, students will develop an integrated understanding of medieval and early modern civilization. Its legacy, along with its intellectual and literary contributions, helps us understand not only of the past but of present society.

**Minor or Integrative Studies Concentration Requirements**

The minor/concentration in Medieval and Renaissance Studies consists of 15 credit hours from the courses (CABR) listed below. Students must include courses from three disciplines.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH/RELS 331</td>
<td>Erly Christian Byzant Art</td>
<td></td>
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<tr>
<td>ARTH 332</td>
<td>Early Med and Romanesque Art</td>
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<tr>
<td>ARTH 333</td>
<td>Gothic Art and Architecture</td>
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<tr>
<td>ARTH 334</td>
<td>The 14th Century</td>
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<tr>
<td>ARTH/HUM/RELS/WGST 335</td>
<td>Women in Medieval Art</td>
<td></td>
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<tr>
<td>ARTH 341</td>
<td>Art&amp;Arch in Early Ren Florence</td>
<td></td>
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<tr>
<td>ARTH 342</td>
<td>High Renaissance &amp; Mannerism</td>
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<tr>
<td>ARTH 343</td>
<td>Renaissance &amp; Reformation Art</td>
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<tr>
<td>ARTH 344</td>
<td>Italian Renaissance Sculpture</td>
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<tr>
<td>ARTH 351</td>
<td>Southern Baroque Art</td>
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<tr>
<td>ARTH 352</td>
<td>Northern Baroque Art</td>
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<tr>
<td>ARTH 454</td>
<td>Rembrandt</td>
<td></td>
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<tr>
<td>COML/HUM/WGST 433</td>
<td>Writing Women in Renaissance</td>
<td></td>
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</tbody>
</table>

**English**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENGL 372</td>
<td>Engl Lit: 1500 to 1600</td>
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<tr>
<td>ENGL 373</td>
<td>Engl Lit: 1600-1660</td>
</tr>
<tr>
<td>ENGL 408</td>
<td>Shakespeare I: Earlier Works</td>
</tr>
<tr>
<td>ENGL 409</td>
<td>Shakespeare II: Later Works</td>
</tr>
<tr>
<td>ENGL 410</td>
<td>Maj Engl Authors of the Renais</td>
</tr>
<tr>
<td>ENGL 413</td>
<td>Shakespeare’s Contemporaries</td>
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</table>

**History**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>HIST 314</td>
<td>England: Tudors and Stuarts</td>
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</tbody>
</table>

**Philosophy**

<table>
<thead>
<tr>
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<th>Title</th>
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</thead>
<tbody>
<tr>
<td>PHIL 307</td>
<td>Medieval Philosophy</td>
</tr>
</tbody>
</table>

**Microbiology**

Microbiology is the study of organisms that usually require the aid of a microscope in order to be seen.

Micro-organisms include viruses, bacteria, archaea bacteria, algae, fungi, and protozoa. Microbiologists seek to understand the interactions between these organisms and components of our biosphere. Many micro-organisms are essential for life, as we know it, to exist on earth. Many of these organisms produce useful biologically active products, such as enzymes and antibiotics. A small number of them cause diseases in plants and animals, including humans.

The study of micro-organisms has led to many important discoveries concerning:

- the complexities, universality and mechanism of expression of the genetic code;
- the transfer of genetic information between species and modulation of the gene pool;
- the mechanism of antigen-antibody reactions and cellular immunity;
- the synthesis of proteins, nucleic acids and other cellular constituents;
- the structure, function and biogenesis of membranes; and,
- the process of molecular and cellular differentiation.

Students majoring in Microbiology will understand basic principles relating to molecular, cellular and organismal biology. In addition to these, students will exhibit proficiency in selected empirical laboratory skills, develop knowledge of contemporary research using the scientific method and demonstrate competence in oral and written communication. This background of knowledge and experience will prepare the students for entry into professional/graduate school or for employment in government, academic or industrial positions. The learning goals are divided into five parts including (1) Conceptual knowledge; (2) Critical and independent thinking skills; (3) Communication skills; (4) Collaborative skills; and (5) Societal impact.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)
Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>MCL 105 and MCL 106</td>
<td>Ancient Greek I and II</td>
<td>4</td>
</tr>
<tr>
<td>ARBC 101 and ARBC 102</td>
<td>Arabic I and II</td>
<td>4</td>
</tr>
<tr>
<td>MCL 111 and MCL 112</td>
<td>Armenian I and II</td>
<td>4</td>
</tr>
<tr>
<td>CHIN 101 and CHIN 102</td>
<td>Chinese I and II</td>
<td>4</td>
</tr>
<tr>
<td>FREN 101 and FREN 102</td>
<td>French I and II</td>
<td>4</td>
</tr>
<tr>
<td>GER 101 and GER 102</td>
<td>German I and II</td>
<td>4</td>
</tr>
<tr>
<td>LAT 101 and LAT 102</td>
<td>Latin I and II</td>
<td>4</td>
</tr>
<tr>
<td>SPAN 101 and SPAN 102</td>
<td>Spanish I and II</td>
<td>4</td>
</tr>
</tbody>
</table>

Pre-Major Requirements
A solid background in mathematics is essential to success in any of the scientific disciplines. Incoming students who intend to choose a major in Microbiology should have completed at least three years of high school mathematics. First year students should plan to enroll in MATH 104 or MATH 105; MATH 113 or MATH 115; or MATH 114 or MATH 116 based on the results of their math placement tests. CHEM 134 or CHEM 144 and CHEM 136 or CHEM 146 are prerequisites to many other courses in the Natural Sciences Department; students majoring in any of the sciences should complete this sequence as soon as possible.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104 &amp; MATH 105</td>
<td>or MATH 113 &amp; MATH 114</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134 or CHEM 144</td>
<td>or CHEM 136 or CHEM 146</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 225 &amp; CHEM 226 &amp; CHEM 227</td>
<td>or Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory</td>
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<tr>
<td>MATH 113 or MATH 115</td>
<td>or Calculus I</td>
<td>4</td>
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</table>

Select one of the following:

- MATH 114 | Calculus II | 4
- STAT 301 or STAT 327 | Biostatistics I or Statistical Computing | 4

Select one of the following:

- PHYS 125 & PHYS 126 | Introductory Physics I and Introductory Physics II (preferred sequence) | 8
- PHYS 150 & PHYS 151 | General Physics I and General Physics II | 8

Total Credit Hours: 39-40

Major Requirements
A minimum of 29 upper level credit hours in Microbiology (MICR) or Biological Sciences (BIOL) must be completed as outlined below.

Note: Students should begin the chemistry sequence before enrolling in any MICR/BIOL course.

Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MICR/Biol 385</td>
<td>Microbiology</td>
<td>4</td>
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<tr>
<td>MICR/Biol 405</td>
<td>Applied &amp; Environ Microbiology</td>
<td>4</td>
</tr>
<tr>
<td>MICR/Biol 406</td>
<td>Microbial Genetics</td>
<td>3</td>
</tr>
<tr>
<td>MICR/Biol 440</td>
<td>Micro Genetics &amp; Physi Lab</td>
<td>1</td>
</tr>
<tr>
<td>MICR/Biol 485</td>
<td>Physiology of Microorganisms</td>
<td>3</td>
</tr>
<tr>
<td>MICR 495</td>
<td>Off-Campus Research</td>
<td>1</td>
</tr>
<tr>
<td>MICR 497</td>
<td>Seminar in Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>MICR 498</td>
<td>Ind Study in Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>MICR 499</td>
<td>Lab in Micro Research</td>
<td>1</td>
</tr>
</tbody>
</table>

Complete an additional 13 credit hours (to reach minimum 29 hours required for the major) from the following, of which at least four credit hours must be from microbiology courses (MICR).

Microbiology (MICR) Courses - A minimum of 4 credit hours from:

- MICR/Biol 380 | Epidemiology | 4            |
- MICR 390 | Topics in Microbiology | 3            |
- MICR/Biol 430 | Medical Virology | 4            |
Select a minimum of 9 credits from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>BIOL 301</td>
<td>Cell Biology</td>
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<tr>
<td>BIOL 306</td>
<td>General Genetics</td>
</tr>
<tr>
<td>BIOL 310</td>
<td>Histology</td>
</tr>
<tr>
<td>BIOL/MICR 380</td>
<td>Principles of Biochemistry</td>
</tr>
<tr>
<td>BIOL 390</td>
<td>Topics in Biology</td>
</tr>
<tr>
<td>BIOL/MICR 430</td>
<td>Medical Virology</td>
</tr>
<tr>
<td>BIOL/MICR 450</td>
<td>Virology</td>
</tr>
<tr>
<td>BIOL/MICR 455</td>
<td>Immunology</td>
</tr>
<tr>
<td>BIOL/MICR 459</td>
<td>Pathogenic Microbiology</td>
</tr>
<tr>
<td>BIOL/BCHM/ CHEM 370</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>BIOL/BCHM/ CHEM 470</td>
<td>Biochemistry II</td>
</tr>
<tr>
<td>BIOL/BCHM/ CHEM 471</td>
<td>Biochemistry Lab I</td>
</tr>
<tr>
<td>BIOL/BCHM/ CHEM 472</td>
<td>Biochemistry Laboratory II</td>
</tr>
<tr>
<td>BIOL/BCHM 474</td>
<td>Molecular Biology</td>
</tr>
<tr>
<td>BIOL 497</td>
<td>Seminar in Biology</td>
</tr>
<tr>
<td>BIOL 498</td>
<td>Independent Study in Biology</td>
</tr>
<tr>
<td>BIOL 499</td>
<td>Laboratory in Biological Resrh</td>
</tr>
</tbody>
</table>

Notes:

1. A maximum of 44 credit hours of MICR or BIOL may count in the 120 hours required for graduation.
2. At least 12 of the 29 credit hours of upper level MICR/BIOL used toward the major must be elected at UM-Dearborn.
3. A maximum of 6 credit hours of Independent Study (courses numbered 495, 498, 499) in any science discipline may count in the 120 hours to graduate.
4. A maximum of 6 credit hours combined in MICR 495/BIOL 495, MICR 498/BIOL 498, MICR 499/BIOL 499 may be applied toward the 29 credit hours required in the major.
5. In the entire minimum 35 credit hours required for both the microbiology major and cognates, students may use either BIOL/BCHM/CHEM 370 or BIOL/BCHM/CHEM 470 and/or 471.

6. Any one course may be used to satisfy only one requirement within the major.

**Minor or Integrative Studies Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses in microbiology (MICR).

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>MATH 325</td>
<td>Probability</td>
</tr>
<tr>
<td>STAT 301</td>
<td>Biostatistics I</td>
</tr>
<tr>
<td>STAT 327</td>
<td>Statistical Computing</td>
</tr>
<tr>
<td>STAT 330</td>
<td>Intro to Survey Sampling</td>
</tr>
<tr>
<td>PHIL/HPS 442</td>
<td>Medical Ethics</td>
</tr>
<tr>
<td>PHIL/STS 485</td>
<td>Philosophy of Science</td>
</tr>
<tr>
<td>ANTH/STS 430</td>
<td>Medical Anthropology</td>
</tr>
<tr>
<td>ANTH 435</td>
<td>Human Genetics</td>
</tr>
<tr>
<td>PSYC 370</td>
<td>Physiological Psychology</td>
</tr>
</tbody>
</table>

**SOC/HPS 440 Medical Sociology**

Total Credit Hours 35

Other appropriate cognate courses may be permitted with approval of the faculty program advisor by petition.

1. No more than a total of six credit hours combined in MICR 495, MICR 498, and MICR 499 may be applied toward the 120 credit hours required for graduation. Both MICR 498 and MICR 499 require independent study contracts agreed upon by a faculty member.
2. All 400-level MICR courses have MICR 385 as a prerequisite.
3. When topic is appropriate – must Petition.
4. STAT 301 or STAT 327 may be used as a pre-major requirement or as a cognate requirement but not both.
5. In the entire minimum 35 credit hours required for both the microbiology major and cognates, students may use either BIOL/BCHM/CHEM 370 or BIOL/BCHM/CHEM 470 and/or 471.

**Notes:**

1. A maximum of 44 credit hours of MICR or BIOL may count in the 120 hours required for graduation.
2. At least 12 of the 29 credit hours of upper level MICR/BIOL used toward the major must be elected at UM-Dearborn.
3. A maximum of 6 credit hours of Independent Study (courses numbered 495, 498, 499) in any science discipline may count in the 120 hours to graduate.
4. A maximum of 6 credit hours combined in MICR 495/BIOL 495, MICR 498/BIOL 498, MICR 499/BIOL 499 may be applied toward the 29 credit hours required in the major.
5. In the entire minimum 35 credit hours required for both the microbiology major and cognates, students may use either BIOL/BCHM/CHEM 370 or BIOL/BCHM/CHEM 470 and/or 471.
6. Any one course may be used to satisfy only one requirement within the major.

**Minor or Integrative Studies Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses in microbiology (MICR).

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<tr>
<td>PSYC 370</td>
<td>Physiological Psychology</td>
</tr>
</tbody>
</table>

**MICR 309 Introduction to Mycology** 4 Credit Hours

An introduction to the biology of the fungi. Classification, structure, industrial use, gastronomic qualities, and disease-producing ability of macroscopic and microscopic forms are studied. Laboratories include microscopic and macroscopic examinations of fungi, and their growth and field studies on the occurrence and classification of edible and poisonous varieties. Three hours lecture, four hours laboratory. (OC). **Prerequisite(s):** BIOL 130 and BIOL 140
MICR 380  Epidemiology  3 Credit Hours
Introduces the methods for infectious disease epidemiology (occurrence and spread in population) and case studies of important disease syndromes and entities. Methods include definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness. Case-studies focus on acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria and other vector-borne diseases. This course emphasizes methods of study that would contribute to understanding disease etiology.
Prerequisite(s): BIOL 140

MICR 385  Microbiology  4 Credit Hours
The biology of microorganisms is considered through study of the properties of bacteria, fungi, algae, protozoa, and viruses. Microbial structures are discussed and correlated with their function. Aspects of cellular metabolism pertinent to microorganisms are emphasized. The interaction of microorganisms and their environment, animate and inanimate, is discussed with respect to the beneficial or harmful effects of the different microbial groups. Laboratory exercises introduce the student to basic, practical microbiological techniques and illustrate various principles of microbial life. Three hours lecture, four hours laboratory. (F,S).
Prerequisite(s): BIOL 140 and (CHEM 134* or CHEM 144*)
Corequisite(s): MICR 385L

MICR 390  Topics in Microbiology  1 to 6 Credit Hours
Current topics in microbiology will be presented through a lecture, discussion and/or laboratory format. Topics will vary, as appropriate, and may cover any area of microbiology including studies on bacteria, algae, fungi, protozoa, viruses, biotechnology, mechanisms of pathogenesis and immunology. (OC).
Prerequisite(s): BIOL 385 or MICR 385

MICR 405  Applied & Environ Microbiology  4 Credit Hours
Advanced treatment of the interplay of microorganisms and the environment. Topics will include soil and water microbiology (bacteria, archaea, fungi, algae, protozoans and viruses) and plant-microbe interactions (pathogenic and symbiotic) as well as the role of microorganisms in decomposition, nutrient cycling (carbon, nitrogen, sulfur and metal cycling), wastewater and biosolids treatment, and bioremediation. 3 hr lec, 1-4 hr lab. For graduate credit elect MICR 505.
Prerequisite(s): MICR 385 or BIOL 385
Restriction(s):
Can enroll if Class is Senior

MICR 406  Microbial Genetics  3 Credit Hours
A course that emphasizes the genetics and molecular biology of bacteria and their viruses. Topics include DNA structure and replication, recombination, DNA repair, genetic mapping, mechanisms of gene transfer, regulation of gene expression, mutagenesis, and recombinant DNA techniques. (YR, W).
Prerequisite(s): MICR 385 or BIOL 385 or BIOL 306

MICR 430  Medical Virology  3 Credit Hours
The course provides a general description of the history and nature of animal virus disease. Emphasis is placed on the pathogenesis and clinical description of specific diseases. Three hours lecture.
Prerequisite(s): MICR 385 or BIOL 385

MICR 440  Micro Genetics & Physi Lab  1 Credit Hour
This course emphasizes the use of advanced microbiological techniques for understanding the genetics and physiology of microorganisms. Experiments focus on the understanding of general microbial phenomena, such as nutrition, metabolism and biochemistry; protein and nucleic acid synthesis; energy generation, enzyme regulation, membrane transport, motility, differentiation, cellular communication and the behavior of populations.
Prerequisite(s): BIOL 385* or MICR 385* or BIOL 301* or BIOL 406* or MICR 406* or BIOL 485* or MICR 485*
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

MICR 450  Virology  4 Credit Hours
The first half of this course deals with bacterial viruses, with emphasis on classical events in this field. The second half surveys the field of animal viruses, with emphasis on recent discoveries, including replication, pathogenesis, and viral association with cancers. Three hours lecture, four hours laboratory. (AY,F).
Prerequisite(s): (BIOL 385 or MICR 385) and CHEM 226

MICR 455  Immunology  4 Credit Hours
A detailed study of the field of immunology. Among the topics covered are various aspects of the immunological response, such as humoral or cell-mediated immunity, cell-cell interactions, and immunology as related to the cause and prevention of disease. Three hours lecture, four hours laboratory. (AY,F).
Prerequisite(s): BIOL 385 or BIOL 301 or MICR 385

MICR 459  Pathogenic Microbiology  4 Credit Hours
An introduction to pathogenic microorganisms and mechanisms of microbial pathogenicity. Disease-causing bacteria, fungi, viruses, and protozoa are studied. Laboratories emphasize clinical approaches to isolation, identification, and treatment. Three hours lecture, four hours laboratory. (AY,F).
Prerequisite(s): BIOL 385 or MICR 385

MICR 485  Physiology of Microorganisms  3 Credit Hours
An in-depth examination of the physiology of microorganisms. Areas of emphasis include the growth and nutrition of microorganisms, the development of viruses, the microbial degradation of organic compounds, the regulation of degradation reactions, and the biosynthesis of uniquely microbial compounds and secondary metabolites, such as antibiotics and toxins. Consideration is given to the natural environments of specific microorganisms. (YR, W).
Prerequisite(s): (BIOL 385 or MICR 385 or BIOL 370 or CHEM 370 or BCHM 370) and CHEM 225*

MICR 495  Off-Campus Research  1 to 3 Credit Hours
Participation in ongoing experimental research at an off-campus laboratory (or in the field). Arrangements made between the research laboratory, (director of field study), the student, and the microbiology concentration advisor. No more than 6 hours combined from MICR 495, 498, and 499 may be credited toward the 120 hours required for a degree. Four to twelve hours laboratory. Permission of concentration advisor. (F,W,S).

MICR 497  Seminar in Microbiology  1 Credit Hour
Topics of current interest in microbiology will be presented by guest lecturers, faculty members or students. Topics chosen will vary from term to term. Can be elected up to three times. One hour seminar. Permission of instructor. (W).


**Required Courses:**

**Pre-requisites:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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The completion of:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
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<tr>
<td>or HIST 102</td>
<td>Medieval and Renaissance World</td>
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</tr>
<tr>
<td>or HIST 103</td>
<td>The World Since 1500 CE</td>
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<tr>
<td>COMP 106</td>
<td>Writing &amp; Rhetoric II</td>
<td>3</td>
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**Required Courses:**

<table>
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<th>Title</th>
<th>Credit Hours</th>
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A minimum of 12 credits required from the following:

**Group A: Regional and Thematic History** - 9 credits from 9

<table>
<thead>
<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>HIST/RELS 337</td>
<td>Islamic Movements Mid East Hist</td>
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<td>HIST/RELS/ WGST 338</td>
<td>Women &amp; Islam Mid East to 1900</td>
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<td>HIST 339</td>
<td>Ottoman Empire in 19th Century</td>
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<tr>
<td>HIST 3130</td>
<td>Armenia Ancient Medieval World</td>
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<td>HIST 3132</td>
<td>Armenians in the Modern World</td>
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<tr>
<td>HIST 3502</td>
<td>The Middle East 570 to 1800 CE</td>
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<tr>
<td>HIST 3511</td>
<td>Modern Middle East, 1918-1945</td>
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<td>HIST 3512</td>
<td>Modern Middle East, 1945-1991</td>
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<tr>
<td>HIST 3520</td>
<td>Lebanon in Modern Middle East</td>
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<td>HIST 3632</td>
<td>The US in the Middle East</td>
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<td>HIST/WGST 4505</td>
<td>Feminism &amp; Mod. Mid. East</td>
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<tr>
<td>HIST 4515</td>
<td>Culture &amp; Hist. in Mod. Iran</td>
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**Group B: Middle East Courses in Non-History Fields** - 3 credits from 3

Any AAST upper level course.

<table>
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<tr>
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<tbody>
<tr>
<td>ANTH 373</td>
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<tr>
<td>ARBC 301</td>
<td>Higher Intermediate Arabic I</td>
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<tr>
<td>ARBC 302</td>
<td>Higher Intermediate Arabic II</td>
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<tr>
<td>ARBC 305</td>
<td>Language of Business</td>
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<tr>
<td>ARBC 331</td>
<td>Survey of Arabic Literature</td>
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<td>ARBC 332</td>
<td>Arabic Cinema</td>
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<tr>
<td>ARBC 350</td>
<td>Arabic Literature and Culture</td>
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<tr>
<td>ARBC 351</td>
<td>Contemporary Arabic Literature</td>
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<tr>
<td>ARBC 390</td>
<td>Topics in Arabic</td>
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</tr>
<tr>
<td>ARTH 384</td>
<td>Islamic Architecture</td>
<td></td>
</tr>
<tr>
<td>ARTH 385/RELS 384</td>
<td>Islamic Decorative Arts</td>
<td></td>
</tr>
<tr>
<td>COMM 430</td>
<td>International Communications</td>
<td></td>
</tr>
<tr>
<td>ECON 444</td>
<td>Economies of the Middle East</td>
<td></td>
</tr>
<tr>
<td>GLOC 301</td>
<td>Intro to Global Cultures</td>
<td></td>
</tr>
<tr>
<td>PHIL 306</td>
<td>Islamic Philosophy</td>
<td></td>
</tr>
<tr>
<td>POL 385</td>
<td>Israeli-Palestinian Conflict</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 12

**NOTES REGARDING MIDDLE EAST STUDIES CERTIFICATE PROGRAM:**

1. Application to the MEST Certificate Program requires the following: Completion of all pre-requisite courses and ONE course from Group A or B (with a grade of B or better in the Group A or B course).
2. Students may replace one course in Group A with a Group B course.
3. A minimum 3.0 GPA in the courses counting in the MEST Certificate is required at the time of graduation and/or posting of the certificate.
4. At least 6 of the 12 credits for the certificate must be completed at UM-Dearborn.
5. All courses must be taken as standard grade mode (no pass/fail mode allowed), with the exception of a maximum of 3 credits of internship/co-op (approved by Petition).
6. A maximum of 3 credit of internship or co-op may satisfy a Group B requirement by Petition.
7. A maximum of 3 credits may share with major, minor, other certificate program.
8. Students may Petition the MEST Chair for use of upper level research based independent study credit.
9. Students with upper level credit in any of the following Middle Eastern languages (with a grade of B or higher) from another institution may Petition to apply that credit to satisfy the Group B requirement: Berber, Persian, Kurdish, Hebrew, Urdu, Dari, Pashto, Baluch, Armenian, Azeri Turkish, Turkish, Uzbek, and Tajik. This is not an exhaustive list. Research languages such as French or German may also be considered if the Petition demonstrates applicability to student’s program study of the Middle East.

Post-baccalaureate students may apply directly through the standard undergraduate non-degree admissions procedure, meeting the following stipulations:

1. Must have a bachelor’s degree completed (any field) with minimum 3.0 GPA, or have completed a minimum of 90 credits in a declared major and be in good standing with a minimum 3.0 GPA.
2. If pre-requisites have not been met at time of application, provisional admission may be granted with the stipulation that pre-requisites
must be completed within two semesters and that no certificate will be granted unless pre-requisites are complete.

Music

The discipline of Music is made up of three areas: Music History (MHIS), Applied Music (MAPP), and Music Theory (MTHY).

These programs share an interest in the music-making of the entire world and a fascination for why human beings, societies, and subcultures make the kinds of music they do.

Minor or Integrative Studies
Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisites:</td>
<td></td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MHIS 100</td>
<td>Intro to Music</td>
<td></td>
</tr>
<tr>
<td>MHIS 120</td>
<td>History of Jazz</td>
<td></td>
</tr>
<tr>
<td>MHIS 130</td>
<td>Intro to World Music</td>
<td></td>
</tr>
</tbody>
</table>

| Select one course from the following: | 3            |
| MTHY 100 | Fundamentals of Music                     |              |
| MTHY 101 | Music Theory I                            |              |
| MTHY 102 | Music Theory II                           |              |

| Required Courses:                     | 12           |
| MTHY 100 or MTHY 101 or MTHY 102 or   |              |
| MTHY 390 or MTHY 100 or MTHY 120 or   |              |
| MTHY 340 or MTHY 341 or MHIS 312 or   |              |
| MHIS 313 or MHIS 314 or MHIS 342 or   |              |
| MHIS 390 or MTHY 100 or MTHY 102 or   |              |
| MTHY 301 or MTHY 302 or MTHY 390 or   |              |
| MTHY 101                                    |              |

Total Credit Hours 18

It is strongly advised that all students pursuing a minor in music take at least one semester of applied music (MAPP 125 Class Piano or MAPP 135 Class Guitar), in addition to the required course work; or that they join one of the musical ensembles active on campus such as Jazz Ensemble, African Drum and Dance Society, or the Gospel Choir for at least one calendar year.

MHIS 100  Intro to Music  3 Credit Hours
A study of Western classical music and its historical development up to the present, through examination of representative musical works.

MHIS 120  History of Jazz  3 Credit Hours
The course provides an introduction to jazz styles within their cultural context. Major figures (Louis Armstrong, Duke Ellington, Charlie Parker, and others) and styles (New Orleans, Big Band, Bebop, Cool Jazz, etc.) will be studied through recordings. Ideas about jazz as the expression of African American culture will be studied. (OC).

MHIS 130  Intro to World Music  3 Credit Hours
This course is designed as an introductory survey of non-western music traditions within the field called ethnomusicology. The music is studied in terms of sounds, musical instruments, forms and their functions in the society and culture that supports them. Music studied includes that of the Middle East, India, Australia, China, Korea and Japan. (YR).

MHIS 311  Music Before Bach  3 Credit Hours
A survey of the early history of music with emphasis on sacred and secular monophonic forms, the rise of part-singing and the opposition to it in the 17th century. (AY).

Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 312 or MHIS 313 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 312  Music from Bach to Brahms  3 Credit Hours
A survey of music in the 18th and 19th centuries with emphasis on the styles and forms of the major composers. (AY).

Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 313 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 313  Music Since 1900  3 Credit Hours
A survey of developments in musical styles (especially concert and popular music) and uses of music (film, theater, and recording technologies) in the 20th and 21st centuries.

Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390 or MTHY 101

MHIS 331  Music of America  3 Credit Hours
An historical and cultural study of American music in both the written and unwritten traditions. Content of the course includes not only the various forms of classical music produced in the new world but also primitive, popular, and vernacular genres. (OC).

Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390 or MAPP 125 or MAPP 126 or MAPP 135 or MAPP 136 or MAPP 145

MHIS 332  Hist of Popular Mus in the USA  3 Credit Hours
An introduction to popular music in the United States. This course will include music of the westward movement, ragtime and blues, the roots and growth of jazz, folk music, country music, music of Broadway and Tin Pan Alley, the roots of and development of rock music, as well as the historical, political and sociological background of the United States as pertinent to music history. (YR).

Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 333  Intro to Gospel Music  3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recordings, videos, film, and at least one field experience. Underlying the course is the theory (Mellonee Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).
MHIS 335  Multimedia and Music  3 Credit Hours
In this course, students will explore case studies of music created, performed, and distributed in combination with other media from the 1960s to the present. Multimedia is understood as any context in which several media are integrated, but particular focus will be paid to technological and creative innovations (such as video games, computers, and phones). The use of music will be considered in such media as film and television, multimedia performance and installation art, and international developments in multimedia production and distribution.
Prerequisite(s): MTHY 100 or MTHY 101 or MTHY 102 or MHIS 100 or MHIS 120 or MHIS 130 or MHIS 150

MHIS 336  Film and Music  3 Credit Hours
In this course, students will be introduced to the varieties of music used in film from c. 1900 to the present. Topics covered include a basic introduction to the musical features of Western European dramatic music; the role of music in the early decades of the 20th century; the growth of film and musical sound in the “classic era” of Hollywood film; the use of music in specific genres such as film noir, science-fiction, epic, and musicals; and the use of popular song in film. Prerequisite: previous completion of MHIS 100, 120, 130, or by permission of the instructor.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130

MHIS 337  Women Musicians/West Mus Hist  3 Credit Hours
Through a historical survey of female musicians from the Middle Ages to the present day, this course takes a critical look at theories of creativity and professionalism as they relate to female musical production. The course deals with women in European “art music” traditions and also in jazz and poplar music. Social and cultural norms dictating appropriate female involvement with music are examined. The historical approach will serve to reveal ways in which terms such as professionalism and virtuosity have continually shifted and changed in reference to female musical performance. The course challenges students to re-think many of the commonly accepted gender-based descriptions of particular genres and elements of music through listening and musical analysis.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or WGST 275 or PSYC 275 or HUM 275 or SOC 275 or ANTH 275 or WGST 303 or ANTH 303 or SOC 303 or PSYC 303 or HUM 303 or WST 275
Restriction(s):
Cannot enroll if Class is Freshman

MHIS 341  Symphony and Symphonic Poem  3 Credit Hours
The symphony and symphonic poem developed from their origins to their more complex later forms. Comparative analysis of similar forms in different periods. (OC).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 313 or MHIS 340 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 343  Opera  3 Credit Hours
A study of selected examples of music theater from the late 16th century to the present, including a comparison of the qualities of sung versus spoken drama, with emphasis on the achievements of such composers as Monteverdi, Mozart, Wagner, and Verdi. (AY).
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MHIS 311 or MHIS 312 or MHIS 313 or MHIS 331 or MHIS 340 or MHIS 341 or MHIS 342 or MHIS 390 or MTHY 100 or MTHY 101 or MTHY 102 or MTHY 301 or MTHY 302 or MTHY 390

MHIS 388  W. African Music: Trad.& Glob.  3 Credit Hours
West African popular music contains a unique mixture of African, Cuban, European and American influences. With the advent of radio and recording, music that was once locally based is now part of a national and international popular music industry. This course offers an overview of modern West African music, both traditional and popular. The course begins with an introduction to traditional West African instruments and musical genres. Next, there is an exploration of the fusion of traditional African styles with European, Cuban and American styles during and after the colonial era. The course culminates with an examination of the contributions of West African musicians to the World Music scene, focusing on issues of representation and Fair Trade.
Prerequisite(s): MHIS 100 or MHIS 120 or MHIS 130 or MTHY 100 or AAAS 106 or AAAS 275 or HUM 100 or HUM 270

MHIS 390  Topics in Music History  3 Credit Hours
Examination of problems and issues in selected areas of music history. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specified topics differ. (OC).

MHIS 399  Independent Study  1 to 3 Credit Hours
Advanced readings or analytical assignments in a particular area of music. Not more than three hours of independent study will be accepted toward the concentration. (FW).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Organizational Change in a Global Environment
This major/concentration presents an interdisciplinary approach to understanding and responding to the most pressing issues today at the intersection of the global and the local.

Minor or Integrative Studies
Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select 15 credits from the following (CAOG):</td>
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<tr>
<td></td>
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<tr>
<td>COMM 477</td>
<td>Prof Communication Ethics</td>
<td></td>
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<tr>
<td>HIST 387</td>
<td>Aspects of the Holocaust</td>
<td></td>
</tr>
<tr>
<td>HIST/STS 3695</td>
<td>American City</td>
<td></td>
</tr>
<tr>
<td>JASS/STS 403</td>
<td>Issues in Cyberspace</td>
<td></td>
</tr>
<tr>
<td>LIBS 364</td>
<td>The European Union</td>
<td></td>
</tr>
<tr>
<td>PSYC 405/CRJ 443/SOC 443/WGST 405</td>
<td>Gender Roles</td>
<td></td>
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<tr>
<td>PSYC 431</td>
<td>Organizational Entry</td>
<td></td>
</tr>
<tr>
<td>PSYC 4305</td>
<td>Psychology in the Workplace</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 15
Philosophy

The Bachelor of Arts in Philosophy uses reason to reflect upon the most basic and profound questions that human beings can ask.

Does life have a meaning? Is there a God? What is truth? How ought one to live one’s life?

Philosophy teaches us how to think and write about these and other basic questions in a reasoned and critical fashion. Because philosophy deals with the fundamental issues that underlie all of our investigations into nature and ourselves, the study of philosophy serves students who are interested in the foundations of the sciences, arts, and social institutions.

The study of philosophy is an excellent preparation for graduate and professional school. Philosophy concentrators are more successful in being admitted to schools of law and medicine than students from almost any other field.

Members of the UM-Dearborn philosophy faculty are committed to excellence in both teaching and scholarly research. They are available both for formal advising and informal discussion. We at UM-Dearborn try to create a relaxed and friendly environment, a community of teachers and students dedicated to philosophical inquiry and discussion. Please call on us whenever we can help.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

Ancient Greek I and II

MCL 105 and MCL 106

Arabic I and II

ARBC 101 and ARBC 102

Armenian I and II

MCL 111 and MCL 112

Chinese I and II

CHIN 101 and CHIN 102

French I and II

FREN 101 and FREN 102

German I and II

GER 101 and GER 102

Latin I and II

LAT 101 and LAT 102

Spanish I and II

SPAN 101 and SPAN 102

Pre-Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 100</td>
<td>Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 233</td>
<td>Critical Thinking 1</td>
<td>3</td>
</tr>
<tr>
<td>or PHIL 234</td>
<td>Symbolic Logic</td>
<td></td>
</tr>
<tr>
<td>PHIL 240</td>
<td>Ethics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours

9

1 Cannot receive credit for both PHIL 234 and PHIL 350

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 301</td>
<td>Ancient Philosophy</td>
<td>6</td>
</tr>
<tr>
<td>&amp; PHIL 302</td>
<td>and Modern Philosophy</td>
<td></td>
</tr>
</tbody>
</table>

Alternative I or II

A student may choose either a traditional major in philosophy (Alternative I) or a program that stresses the relationship of philosophy to other areas of study (Alternative II).
With regard to both Alternatives, students are strongly encouraged to work closely with a philosophy faculty adviser to develop a coherent program. Alternative I requires a total of 24 credit hours in philosophy (PHIL) courses at the upper level (300 or 400 level) and six upper-level hours from an approved list of cognate courses in one or more disciplines outside philosophy. Alternative II requires a total of 18 credit hours in philosophy courses at the 300 or 400 level and 12 credit hours upper-level of cognate courses from the approved list. Satisfactory completion of PHIL 301 Ancient Philosophy and PHIL 302 Modern Philosophy will be counted as part of the 24 hours in philosophy in Alternative I or as part of the 18 hours in philosophy in Alternative II.

Addition Notes: 1. A maximum of 44 credit hours in PHIL may count in the 120 hours required to graduate. 2. Credit cannot be given for both PHIL 234 and PHIL 350. 3. At least 15 credit hours of upper level Philosophy (PHIL) required for the major must be elected at UM-Dearborn.

Cognates (CALC)

As noted above, cognate requirements depend on the student’s choosing between Alternative I and Alternative II.

List of approved Cognate courses (CALC):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH/HUM/PSYC/SOC/WGST 303</td>
<td>Intro To Women's &amp; Gender Stud</td>
</tr>
<tr>
<td>ANTH/WGST 315</td>
<td>Body Image and Culture</td>
</tr>
<tr>
<td>ANTH 320</td>
<td>Culture and Int'l Business</td>
</tr>
<tr>
<td>ANTH 325/ENST 326</td>
<td>Anth of Health and Environment</td>
</tr>
<tr>
<td>ANTH 331</td>
<td>Human Evolution</td>
</tr>
<tr>
<td>ANTH 336</td>
<td>Introduction to Primates</td>
</tr>
<tr>
<td>ANTH/AAAS/STS 340</td>
<td>Race and Evolution</td>
</tr>
<tr>
<td>ANTH/STS 345</td>
<td>Cultural Ecology and Evolution</td>
</tr>
<tr>
<td>ANTH/RELS 360</td>
<td>Myth, Magic, and Mind</td>
</tr>
<tr>
<td>ANTH 370</td>
<td>Indians of North America</td>
</tr>
<tr>
<td>ANTH/AAAS 371</td>
<td>African Exper in the Americas</td>
</tr>
<tr>
<td>ANTH 372</td>
<td>Anthropology of Latin America</td>
</tr>
<tr>
<td>ANTH 373</td>
<td>Anth Persp on the Middle East</td>
</tr>
<tr>
<td>ANTH 374</td>
<td>Anthropology of Europe</td>
</tr>
<tr>
<td>ANTH 376</td>
<td>Power &amp; Privilege in SE Mich</td>
</tr>
<tr>
<td>ANTH/WGST 406</td>
<td>Culture and Sexuality</td>
</tr>
<tr>
<td>ANTH 407/SOC 4075/WGST 407</td>
<td>Sexual Praxis and Theory</td>
</tr>
<tr>
<td>ANTH/STS 409</td>
<td>Human Body, Growth &amp; Health</td>
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<tr>
<td>ANTH/CRJ/SOC/WGST 412</td>
<td>Men and Masculinities</td>
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<tr>
<td>ANTH/WGST 420</td>
<td>Kinship and Marriage</td>
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<tr>
<td>ANTH 421</td>
<td>Education and Culture</td>
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<tr>
<td>ANTH 422</td>
<td>Narrative Anthropology</td>
</tr>
<tr>
<td>ANTH/STS 430</td>
<td>Medical Anthropology</td>
</tr>
<tr>
<td>ANTH 435</td>
<td>Human Genetics</td>
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<tr>
<td>ANTH/RELS 440</td>
<td>Religion and Culture</td>
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<tr>
<td>ANTH 444</td>
<td>Political Anthropology</td>
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<tr>
<td>ANTH 450</td>
<td>Anthropological Theory</td>
</tr>
<tr>
<td>ANTH/CRJ 455/SOC 4555/WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
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<tr>
<td>ANTH 460</td>
<td>Economic Anthropology</td>
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<tr>
<td>ANTH/HUM 477</td>
<td>Ethnographic Film</td>
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<tr>
<td>ANTH/HUM/COMM/SOC/WGST 481</td>
<td>Gender and Globalization</td>
</tr>
<tr>
<td>ARBC 351</td>
<td>Contemporary Arabic Literature</td>
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<tr>
<td>ARTH/HIST/HUM 305</td>
<td>The Arts &amp; Culture of Detroit</td>
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<tr>
<td>ARTH/HUM 311</td>
<td>Art of China</td>
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<td>ARTH/HUM 312</td>
<td>Art of Japan</td>
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<td>ARTH/HUM 313</td>
<td>Chinese Painting</td>
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<tr>
<td>ARTH/HUM 315</td>
<td>Early Chinese Art and Culture</td>
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<td>ARTH 319</td>
<td>Egyptian Art</td>
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<td>ARTH 321</td>
<td>Greek Art</td>
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<td>ARTH 322</td>
<td>Roman Art</td>
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<td>ARTH/RELS 327</td>
<td>Gods, Myth and Worship</td>
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<tr>
<td>ARTH/RELS 331</td>
<td>Early Christian Byzanz Art</td>
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<tr>
<td>ARTH 332</td>
<td>Early Med and Romanesque Art</td>
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<tr>
<td>ARTH 333</td>
<td>Gothic Art and Architecture</td>
</tr>
<tr>
<td>ARTH 334</td>
<td>The 14th Century</td>
</tr>
<tr>
<td>ARTH/HUM/RELS/WGST 335</td>
<td>Women in Medieval Art</td>
</tr>
<tr>
<td>ARTH 341</td>
<td>Art &amp; Arch in Early Ren Florence</td>
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<tr>
<td>ARTH 342</td>
<td>High Renaissance and Mannerism</td>
</tr>
<tr>
<td>ARTH 343</td>
<td>Renaissance &amp; Reformation Art</td>
</tr>
<tr>
<td>ARTH 344</td>
<td>Italian Renaissance Sculpture</td>
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<td>ARTH 351</td>
<td>Southern Baroque Art</td>
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<td>ARTH 352</td>
<td>Northern Baroque Art</td>
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<td>ARTH 360</td>
<td>Art of Glass</td>
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<td>ARTH 361</td>
<td>American Art</td>
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<td>ARTH 362</td>
<td>Impressionism and Post-Impress</td>
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<td>ARTH 363</td>
<td>Arts of the Twentieth Century</td>
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<td>ARTH 364</td>
<td>Picasso</td>
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<td>Modern Architecture</td>
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<td>ARTH 366</td>
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<td>Emerg of Modern U.S.,1876-1916</td>
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<td>HIST 359</td>
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<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
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<td>Public Argument and Advocacy</td>
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<td>SPEE 340</td>
<td>Persuasion &amp; Social Movements</td>
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Minor or Integrative Studies
Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in philosophy (PHIL).

PHIL 100  Introduction to Philosophy  3 Credit Hours
An introduction to philosophical thinking through an examination of some timeless human problems such as the existence of God, the problem of freedom, and the attempt to find an ethical foundation for life. (F.W).

PHIL 120  Philosophy and Religion  3 Credit Hours
An examination of how basic concerns of philosophy impinge on questions of religious beliefs. Using philosophical texts, the course will explore such questions as the following: Does God exist? Does human life have a purpose? How can we know whether religious claims are true?

PHIL 200  The Human Condition  3 Credit Hours
The human condition as seen in selected works of philosophy and literature. Typical issues: the meaning of life, the existence of God, moral responsibility for human actions, and the role of society in promoting or hindering human excellence. (OC).

PHIL 233  Critical Thinking  3 Credit Hours
A study of the nature and justification of reasoned arguments, both deductive and inductive, as they occur in natural language. A consideration of topics in language that promote an understanding of ways of reasoning, including definitions and fallacies. (F.W).

PHIL 234  Symbolic Logic  3 Credit Hours
This course will examine the central themes in modern symbolic logic including consistency, truth-functionality, sentential first-order predicate logic, and the logic of identity and possibility. These themes and their relation to the wider philosophical context will be discussed. (F.W).

Prerequisite(s): PHIL 233

PHIL 240  Ethics  3 Credit Hours
A study of ethical concepts and theories. Typical questions: Is the morality of an action based on its results or on the intent of the person acting? Is ethics purely rational? What makes a good person? Ethical principles may be applied to such issues as abortion, capitalism, war, and capital punishment. (F.W).

PHIL 301  Ancient Philosophy  3 Credit Hours
An examination of the metaphysical, epistemological, ethical, and political theories of the ancient Greek philosophers with particular attention paid to Plato and Aristotle and to the influence of their ideas on Western culture. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.

Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 302  Modern Philosophy  3 Credit Hours
A study of 17th and 18th century European philosophers including such philosophers as Descartes, Spinoza, Hume, and Kant with emphasis on their metaphysical and epistemological theories and how those theories provided a foundation for science and a bedrock for modern thought. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.

Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 303  Kant and the 19th Century  3 Credit Hours
The development of philosophical thought from Kant through the 19th century. In addition to Kant, figures discussed may include Hegel, Schopenhauer, Marx, Kierkegaard, and Nietzsche. Readings in selected texts. (OC).

Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 304  Twentieth-Century Philosophy  3 Credit Hours
A study of selected topics, movements, and figures in the philosophy of the twentieth century, including such representative subjects as continental philosophy, contemporary philosophy of mind, and analytic philosophy. Designed to meet the needs of students in literature and the history of ideas as well as philosophy students. Students electing this course must have successfully completed a previous course in philosophy or have permission of the instructor.

Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 305  Marxism  3 Credit Hours
This course is an introduction to the philosophy of Marxism which emphasizes Marx’s theories of human nature, alienation, class struggle, and revolution through readings of classical and contemporary texts. Students electing this course must have successfully completed a previous course in philosophy or have permission of the instructor.

Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 306  Islamic Philosophy  3 Credit Hours
The course covers the development of Islam, basic Islamic doctrine, and a selection of issues that have been debated within the Islamic philosophical tradition. Students read original texts by Muslim philosophers and think critically about the issues in them and the arguments raised about them. All readings in English; no knowledge of Arabic required.
PHIL 307  Medieval Philosophy  3 Credit Hours
This course is an introduction to Medieval Philosophy and is structured around the ideas and works of key philosophers in the Christian, Islamic and Jewish religious traditions. It attempts to answer the question of what 'Medieval Philosophy' is and how it fits into the larger context of the Western philosophical tradition. The course is roughly divided into four sections based on the chronological development of philosophy through the Middle Ages – (I) Early Medieval Christian Philosophy, (II) Islamic Philosophy, (III) Jewish Philosophy and (IV) Latin Christian Philosophy in the Thirteenth and Fourteenth Centuries. We will look at what some famous Christian, Muslim and Jewish philosophers, such as Augustine, Boethius, Anselm, Peter Abelard, Al-Ghazali, Ibn Rushd, Saadia, Maimonides, Aquinas, Scotus and Ockham had to say about a diverse range of philosophical issues and topics, including the existence and nature of God, free will, morality, reason and revelation, human nature and the problem of universals. (YR)
Prerequisite(s): PHIL 100 or HUM 200 or PHIL 200 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 350

PHIL 310  Darwinism and Philosophy  3 Credit Hours
Darwinism represents a challenge to the traditional view of human life as radically separate from the rest of the natural world. This course will examine the philosophical implications of this world view. It will address questions such as these: Is Darwinism compatible with traditional religion? Does Darwinism imply that human life and the cosmos are without purpose? Can human life be meaningful if it is the result of evolution and natural selection? Does Darwinism require us to change our view of nature? What are the ethical implications of a Darwinian view of life and the universe?
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 315 or PHIL 320 or PHIL 350 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490
Restriction(s):
Cannot enroll if Class is

PHIL 312  Environmental Ethics  3 Credit Hours
The relationship of human beings to the non-human environment raises pressing moral and political issues. This course will use the theories and concepts of philosophical ethics to explore such questions as human obligations to non-human animals; the preservation of wilderness; balancing economic, aesthetic, and spiritual values; and the problems of pollution, urban sprawl, and ecological justice. Prerequisite or permission of instructor. (YR).
Prerequisite(s): PHIL 100 or PHIL 233 or PHIL 240* or CRJ 240 or ENST 105 or ENST 301

PHIL 315  Ethics of War & Peace  3 Credit Hours
A philosophical exploration of ethical issues underlying war and peace. The course will treat such questions as the following: what wars, if any, are just? Are there moral restrictions on the methods that may be used? What individuals are morally responsible for wartime decisions, and to what degree? Discussion of these issues will be used to elucidate larger problems in ethical theory. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 320 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 320  The Problem of Human Freedom  3 Credit Hours
A critical examination of the idea of freedom: the free will/determinism debate, moral and legal responsibility, punishment, and the relationship between metaphysical and social freedom. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 327  Kierkegaard & Nietzsche  3 Credit Hours
This course will explore the philosophical views of Kierkegaard and Nietzsche, examining the interconnections and differences between these two thinkers as well as each one’s contributions to philosophy and psychology. The course will focus on both philosophers’ emphasis on the individual and how that emphasis arose as a response to the social, political and economic changes in the 19th century and anticipated and influenced philosophical developments in the 20th century, in particular existentialism.

PHIL 335  Philosophy of Law  3 Credit Hours
An examination of some of the important philosophical issues relevant to law and legal theory, including legal punishment, legal responsibility, and the relationship between law and morality. Both classical and contemporary writings will be studied. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 350 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 340  Analytic Philosophy  3 Credit Hours
An introduction to philosophy as the analysis and evaluation of fundamental concepts and principles occurring in ordinary life and in the sciences. While analytic philosophy in the twentieth century is emphasized, its antecedents in the history of western philosophy will be examined. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor. (OC).
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 350 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 350  Symbolic Logic  3 Credit Hours
This course will examine the central themes in modern symbolic logic including consistency, truth-functionality, sentential first-order predicate logic, and the logic of identity and possibility. These themes and their relation to the wider philosophical context will be discussed. (F,W).
PHIL 360  Philosophy of Technology 3 Credit Hours
A study of both the history of, and current issues in, the philosophy of technology. This course will examine the deeper meaning and implications of our modern technological society. Questions examined include: What is the definition and nature of technology? How did the concept originate in Western thought? What is the relationship between modern industrial technology and the ‘mechanistic’ worldview? How do Western religious beliefs influence our attitudes about technology? Is technological progress socially determined, or is it culturally independent? In what ways has our technological society been supportive of, or detrimental to, overall human well-being? Students will cover both classic and contemporary readings.

PHIL 365  Philosophy of Religion 3 Credit Hours
A philosophical examination of basic religious problems, such as the nature and grounds of religious belief, the existence and nature of God, human immortality, the relations of religion and science, and the nature of religious language. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 369 or PHIL 301 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490

PHIL 369  Philosophy of Art 3 Credit Hours
An examination and critique of both traditional and contemporary theories of art as well as an examination of theories of the aesthetic including theories of beauty, taste, and the aesthetic attitude. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor. (OC).
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490 or PHI 371

PHIL 370  Philosophy of Mind 3 Credit Hours
A study of current philosophical work in the area of consciousness studies examining the nature and function of human consciousness and the problem of reconciling an objective, scientific view of consciousness with our subjective experience of it. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490

PHIL 371  Philosophy in Literature 3 Credit Hours
An exploration of philosophical problems as they are encountered in works of literature. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490

PHIL 375  Problems of Human Knowledge 3 Credit Hours
A study of issues and problems that arise in considering the nature of knowledge: an examination of traditional theories of knowledge and recent critiques of those theories. Readings of classical and contemporary texts. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 380 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490

PHIL 380  Theories of Reality 3 Credit Hours
A critical examination of philosophical positions that claim to distinguish between what is real and what is apparent; an evaluation of the basic principles of philosophy and of extra-philosophical disciplines. Readings of classical and contemporary texts. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490

PHIL 384  Feminist Philosophy 3 Credit Hours
Feminists working in philosophy, most notably in the 19th and 20th centuries, have altered the traditional philosophical canon by first, recovering women philosophers who were essentially erased from the history and secondly, by extending and contributing to the standard questions of philosophy. For example, one central question of philosophy; "What can we know with certainty?" has been transformed through a feminist lens and reinterpreted as "What does one's gender, social location, and cultural framework contribute to what one knows?" In this course we will look at the variety of feminist philosophical theories with a focus on epistemology, metaphysics, and ethics.
Prerequisite(s): PHIL 100 or WST 275 or WGST 275 or WGST 303 or HUM 275 or ANTH 275 or PSYC 275 or SOC 275 or HUM 303 or ANTH 303 or PSYC 303 or SOC 303

PHIL 390  Topics in Philosophy 3 Credit Hours
Examination of problems and issues in selected areas of philosophy. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Typical topics: Philosophy of Language, Minds and Machines, Moral Responsibility. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 355 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHI 442 or PHI 445 or PHI 485 or PHI 490

PHIL 390Q  Topics in Philosophy 3 Credit Hours
In this course students will explore the ways that cognitive and affective aspects of social identities (race, gender, socio-economic class, sexual orientation, dis/ability) intersect with issues of social power and privilege to make critical thinking and critical dialogue particularly challenging. We will consider how the history of ‘argument’ in Western philosophy has contributed to the challenges of social identity debates and we will explore a variety cognitive biases and logical fallacies as well as strategies for effectively countering these biases and fallacies.
PHIL 390R  Topics in Philosophy  3 Credit Hours
Topic Title: Eastern Philosophy: Confucianism, Daoism, and Buddhism - The purpose of this course is to examine the roots and development of the three main strands of thought in Eastern Philosophy: Confucianism, Daoism, and Buddhism. We will do this by first working through the foundational ideas and arguments as they are found in the work Kogzi (Confucius) and Laozi, analyzing the basic arguments and disagreements, which pave the way for subsequent thinkers. We will then look at the development of these ideas in the followers of these two schools of thought. We end by examining the original development of Buddhism in India, and its subsequent transformation to Zen or Chan Buddhism as it encounters Daoism in China. Given the significant emphasis on praxis (as opposed to theory) in both Daoism and Zen tradition, it will often be the case that the distinction between philosophy and religion becomes blurred. Eastern Philosophy has a long and rich tradition, often beginning with radically different starting points and concerns from its Western counterpart (although there are certain overlaps and similarities). As such, this course will offer a window into a set of philosophical discourses that have only recently been seriously examined in the West.
Prerequisite(s): PHIL 100 or PHIL 200 or PHIL 233 or PHIL 234 or PHIL 240

PHIL 390S  Topics in Philosophy  3 Credit Hours
Topic Title: Philosophy of Race - The concept of "race" remains controversial. The controversy concerns two broad issues: first, whether "race" is a legitimate way to demarcate human groups, as opposed to, say ethnicity, or simply seeing all persons as individuals; and, second, whether the continued use of the category of race exacerbates racism. Contemporary philosophers have been making important contributions to these issues, addressing such questions as: what is the true meaning of the concept of "race"? Is the concept of race a mere myth or fiction? Does the use of racial categories exacerbate racism? What race is a mixed race person? What is the race of Latinos or Arabs? How can racism best be reduced and resisted? This course will explore recent philosophical work on the concept of race and the political effects of racial identities. Students will gain an understanding of how philosophers analyze and use concepts, especially as they apply to the politics of race in the U.S. Students will also gain a better understanding of the underlying causes of the rash of police lynching that has galvanized the Black Lives Matter Movement.
Prerequisite(s): PHIL 100 or PHIL 200 or PHIL 233 or PHIL 234 or PHIL 240

PHIL 399  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in philosophy in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. (FW).

PHIL 415  Existentialism and Its Sources  3 Credit Hours
An exploration of the literary sources of existentialism and a critical study of selected philosophical texts. Particular themes - death, subjectivity, alienation, commitment, and freedom - will be considered in an attempt to formulate an existential conception of the human condition. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490

PHIL 441  Social and Political Phil  3 Credit Hours
An analysis of some fundamental problems of political and social philosophy, with special attention to the way in which theory may function as a guide to specific policies. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 411 or PHIL 442 or PHIL 485 or PHIL 490

PHIL 442  Medical Ethics  3 Credit Hours
An examination of moral issues in medicine. Among the problems to be considered are truth-telling and paternalism in the doctor-patient relationship, psychosurgery and behavior control, death and euthanasia, the allocation of scarce resources, and genetic counseling and control. Specific attention will be given to ethical theories and to philosophical concepts such as rights, autonomy, and justice. Students cannot receive credit for both PHIL 442 and PHIL 542. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 445 or PHIL 490

PHIL 444  Contemporary Ethical Issues  3 Credit Hours
An intensive study of a topic in recent ethical theory. Topics will vary with each offering. Among the topics: ethics and law, utilitarianism, virtue theory, theories of justice, morality and emotion, ethics and partiality. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 445 or PHIL 490

PHIL 445  Philosophy of Science  3 Credit Hours
A critical study of the foundations of the sciences, natural and social, with emphasis on the following topics: the nature of scientific method, theories and explanation, probability and determinism, the unity of the sciences. Students electing this course must have successfully completed a previous course in philosophy or have permission of instructor.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 335 or PHIL 340 or PHIL 350 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 445 or PHIL 490

PHIL 449  Studies in Philosophy  1 to 4 Credit Hours
Intensive study of a figure, movement, or issue in philosophy. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Typical topics: Plato's dialogues, philosophical foundations of mathematics, minds and machines. (OC).

PHIL 496  Independent Studies  1 to 3 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy. Selected in accordance with needs and interests of those enrolled.
PHIL 497  Independent Studies  1 to 3 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy, selected in accordance with the needs and interests of those enrolled.

PHIL 498  Independent Studies  1 to 4 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy, selected in accordance with the needs and interests of those enrolled. Credit hours will vary. (F,W).

PHIL 499  Independent Studies  1 to 4 Credit Hours
Topics in philosophy not ordinarily included in other courses in philosophy, selected in accordance with the needs and interests of those enrolled. Credit hours will vary. (F,W).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Physics

Physics is the study of the most fundamental properties of matter and energy.

The Bachelor of Science in Physics has been designed with the recognition that a student might choose to concentrate in physics for a variety of reasons. In addition to meeting the needs of those planning to continue their physics education in graduate school, the program serves students planning to pursue technical careers immediately after graduation, those seeking to enter medical, dental or other professional schools, and those planning to earn certification as high school teachers.

After completing a core curriculum in physics and mathematics and an introduction to the life and other physical sciences, students have the opportunity to gain first-hand experience in basic and applied physics research. Most advanced students are able to participate in the research projects of faculty members during any of three University terms. Similar experiences may be arranged in hospital, industrial or government research facilities in the area.

The physics faculty have concentrated their efforts in atomic physics, condensed matter physics, biophysics and astrophysics. Physics majors have worked in these areas and also on projects in the interdisciplinary application of physics in medicine and the environment.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

- Ancient Greek I and II  MCL 105 and MCL 106
- Arabic I and II  ARBC 101 and ARBC 102
- Armenian I and II  MCL 111 and MCL 112
- Chinese I and II  CHIN 101 and CHIN 102
- French I and II  FREN 101 and FREN 102
- German I and II  GER 101 and GER 102
- Latin I and II  LAT 101 and LAT 102
- Spanish I and II  SPAN 101 and SPAN 102

Pre-Major Requirements

A solid background in mathematics is essential to success in any scientific discipline. Incoming students who intend to major in physics should have completed at least three years of high school mathematics. First-year students should plan to enroll in MATH 105, MATH 115 or MATH 116 based on the results of their math placement tests. PHYS 150 and PHYS 151 are prerequisites to all other physics courses. Students should complete these courses as soon as possible.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 144</td>
<td>Gen Chemistry IB</td>
<td></td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>12</td>
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<tr>
<td>&amp; MATH 116</td>
<td>and Calculus II</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 215</td>
<td>and Calculus III</td>
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</tr>
<tr>
<td>MATH 216</td>
<td>Intro to Diff Equations</td>
<td>3-4</td>
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<tr>
<td>or MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
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<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>3</td>
</tr>
<tr>
<td>or BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
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<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>3</td>
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</tbody>
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Select two additional science courses from the following: 8

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CHEM 136</td>
<td>General Chemistry IIA</td>
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<tr>
<td>or CHEM 144</td>
<td>General Chemistry IIB</td>
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<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>3</td>
</tr>
<tr>
<td>or BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 38-39

**Major Requirements**

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 305</td>
<td>Contemporary Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 360</td>
<td>Instrumentation for Scientists</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 401</td>
<td>Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 403</td>
<td>Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 406</td>
<td>Thermal and Statistical Physic</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 453</td>
<td>Quantum Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 460</td>
<td>Advanced Physics Laboratory</td>
<td>3</td>
</tr>
</tbody>
</table>

Select six additional credit hours of lecture courses in astronomy and/or physics, chosen from (only one course can be astronomy (ASTR)): 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 301</td>
<td>Astrophysical Concepts</td>
<td></td>
</tr>
<tr>
<td>ASTR 330</td>
<td>The Cosmic Distance Scale</td>
<td></td>
</tr>
<tr>
<td>ASTR 361</td>
<td>Observational Techniques</td>
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<tr>
<td>ASTR 390</td>
<td>Topics in Astronomy</td>
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<tr>
<td>ASTR/PHYS 421</td>
<td>Stellar Astrophysics</td>
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<td>ASTR 445</td>
<td>Galaxies and Cosmology</td>
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<tr>
<td>PHYS 314</td>
<td>Computational Physics</td>
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<td>PHYS 320</td>
<td>Environmental Physics</td>
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<td>PHYS 370</td>
<td>Intro to Mathematical Physics</td>
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<td>PHYS 390</td>
<td>Current Topics in Physics</td>
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<td>PHYS 405</td>
<td>Optics</td>
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<td>PHYS 416</td>
<td>Biological Physics</td>
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<td>PHYS 457</td>
<td>Atomic and Nuclear Physics</td>
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<td>PHYS 463</td>
<td>Solid State Physics</td>
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Select three additional credit hours of laboratory/research courses, selected from: 3

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PHYS 460</td>
<td>Advanced Physics Laboratory (may be repeated for credit)</td>
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PHYS 150 General Physics I 4 Credit Hours
Part I of an integrated, two-semester, calculus-based treatment of physics, with emphasis on the solution of physical problems through the understanding of a few basic concepts. Topics are drawn from mechanics. This course and PHYS 151 are normally taken by concentrators in physics, chemistry, biochemistry, mathematics, and engineering. Three hours lecture, one hour discussion, three hours laboratory. (FW).
Prerequisite(s): MATH 115* or Mathematics Placement with a score of 116
Corequisite(s): PHYS 150L

PHYS 151 General Physics II 4 Credit Hours
A continuation of PHYS 150. Topics are drawn from electricity and magnetism, and optics. Three hours lecture, one hour discussion, three hours laboratory. (FW).
Prerequisite(s): PHYS 150 and (MATH 116* or Mathematics Placement with a score of 215)
Corequisite(s): PHYS 151L

PHYS 305 Contemporary Physics 3 Credit Hours
An introduction to contemporary topics in physics of interest to science, mathematics and engineering students. Topics include relativity, and quantum mechanics and their applications to atoms, molecules, nuclei, solid state phenomena, and cosmology. Three hours lecture. (W).
Prerequisite(s): (PHYS 126 or PHYS 151) and (MATH 116 or Mathematics Placement with a score of 215)

PHYS 314 Computational Physics 3 Credit Hours
An introduction to numerical and computational techniques in physics and astronomy. Topics include an introduction to scientific computing, fitting data to a model, visualizing results, plotting, error analysis, and writing software to solve physical problems. Applications will be selected from a variety of subfields, including: classical mechanics, statistical physics, quantum physics, electromagnetism, chaos, biophysics, and astrophysics. Three hours lecture.
Prerequisite(s): PHYS 151 and (MATH 205* or MATH 215*)

PHYS 320 Environmental Physics 3 Credit Hours
A survey of the applications of physical principles to the environment, and to the conversion, transfer, and use of energy. Problems of transportation, meteorology, and thermal pollution are included. Three hours lecture. (OC).
Prerequisite(s): PHYS 126 or PHYS 151

PHYS 360 Instrumentation for Scientists 4 Credit Hours
An introduction to the principles of electronic instrumentation used in scientific research. Methods of converting physical measurements into electronic signals by means of electrical circuits, transistors, digital and analog integrated circuits will be discussed. Digital computers as general purpose laboratory instruments will be explored. Students will complete individual projects. Three hours lecture, four hours laboratory. (F).
Prerequisite(s): PHYS 126 or PHYS 151

PHYS 370 Intro to Mathematical Physics 3 Credit Hours
As introduction to those mathematical methods that are widely used in understanding the physical phenomena exhibited by Nature. Topics include vector analysis, linear algebra, complex variables, Fourier analysis, and differential equations. Emphasis is on the application of these techniques to physical problems of interest to students in mathematics, engineering, and the physical sciences. Three hours lecture. (AY).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 151

PHYS 390 Current Topics in Physics 3 Credit Hours
A lecture course in a topic of current interest in physics. Topics vary and are announced in the current Schedule of Classes. Three hours lecture. (OC).
Prerequisite(s): PHYS 305*

PHYS 401 Mechanics 3 Credit Hours
A study of the classical physics of the motions of single particles, systems of particles, and rigid bodies. Topics include central force laws and planetary motion, collisions and scattering, rigid body motion, oscillations, Lagrange's equations, and Hamilton's principle. Three hours lecture. (F).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 151

PHYS 403 Electricity and Magnetism 3 Credit Hours
The study of electrostatics, magnetostatics and electrodynamics using Maxwell's equations. Of interest to engineers and physical scientists, the course focuses on the logical development of Maxwell's equations from experimental laws and on their application to electromagnetic phenomena. Three hours lecture. (W).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 151

PHYS 405 Optics 3 Credit Hours
An introduction to wave and ray optics for students in engineering, mathematics, and the physical sciences. Topics of discussion include reflection and refraction at dielectric surfaces, lenses and mirrors, fiber optics, polarization, interference, and Fraunhofer and Fresnel diffraction. Additional material on coherence, Fourier optics and spatial filtering, and holography is presented as dictated by students' needs and interests, and as time permits. Three hours lecture. (AY).
Prerequisite(s): (MATH 205 or Mathematics Placement with a score of 215 or MATH 215) and PHYS 151

PHYS 406 Thermal and Statistical Physic 3 Credit Hours
A study of thermodynamic phenomena using the methods of statistical mechanics. Designed for engineering students and concentrators in mathematics and the physical sciences; extensive application is made to physical, chemical and biological systems and phenomena, including solids, liquids, gases, paramagnets, thermal radiation, DNA, hemoglobin, semiconductors, heat engines, chemical reactions, and phase transitions. Three hours lecture. (F).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 151

PHYS 416 Biological Physics 3 Credit Hours
A course based on the methodology of physics with particular emphasis on the applications of theoretical models and experimental methods to biological objects and systems. Topics may include bioelectricity, membranes, polymers, and physical chemistry of macromolecules. Three hours lecture. (OC).
Prerequisite(s): MATH 205 or (MATH 215 and PHYS 151)

PHYS 421 Astrophysics 3 Credit Hours
A calculus-based introduction to several major areas of modern astrophysics for students concentrating in the physical sciences, mathematics, and engineering. Topics to be covered include observable properties of stars and star systems, stellar structure and evolution, binary systems and galactic x-ray sources, galaxies and quasars, and cosmology. Three hours lecture. (AY).
Prerequisite(s): (PHYS 305 or ASTR 301 or ASTR 330) and (MATH 205 or MATH 215)
PHYS 453  Quantum Mechanics  3 Credit Hours  
Concepts of quantum mechanics with applications of the Schrodinger wave equation to the simpler atoms, molecules, and nuclei. Topics of current interest to physicists, chemists, and biologists are discussed.  
Three hours lecture.  (F).
Prerequisite(s): PHYS 305 and MATH 216

PHYS 457  Atomic and Nuclear Physics  3 Credit Hours  
Topics in modern atomic physics such as optical and radio-frequency spectroscopy and scattering of atoms and electrons are considered.  
An introduction to nuclear physics, including nuclear interactions and structure, radioactive decay, fission, and fusion.  
Three hours lecture.  (AY).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 305

PHYS 460  Advanced Physics Laboratory  3 Credit Hours  
Experiments in both classical and modern physics using contemporary techniques.  
Commercial apparatus is used in several experiments.  
Advanced students are encouraged to initiate and conduct their own experiments.  
In the planning of experiments and the presentation of oral and written reports is included.  
One hour recitation, six hours laboratory. Course may be repeated for credit.  (W).
Prerequisite(s): PHYS 305* and PHYS 360

PHYS 463  Solid State Physics  3 Credit Hours  
A study of the structure and properties of the solid state of matter with emphasis on crystalline solids, crystal structures, lattice dynamics, electrons in metals and semiconductors, and dielectric and magnetic properties of solids.  
Three hours lecture.  (AY).
Prerequisite(s): (MATH 205 or MATH 215 or Mathematics Placement with a score of 215) and PHYS 305

PHYS 490  Topics in Physics  1 to 3 Credit Hours  
A lecture course in a topic of current interest in physics.  
Topics vary and are announced in the current Schedule of Classes. One to three hours lecture.  (OC).

PHYS 495  Off-Campus Research  1 to 3 Credit Hours  
Participation in ongoing experimental research at an off-campus laboratory. Assignments made by cooperative or internship agreement between the research laboratory, the student, and the physics concentration advisor. Course may be repeated for credit. Four to twelve hours laboratory. Permission of concentration advisor.  (F,W,S).

PHYS 497  Seminar in Physics  1 to 3 Credit Hours  
Current topics from various areas in pure and applied physics are reported upon by students, faculty, and guest lecturers.  
Topics presented will vary from year to year. Course may be repeated for credit. One to three hours seminar.  (W).

PHYS 498  Directed Studies in Physics  1 to 3 Credit Hours  
Special topics in physics chosen by agreement between student and instructor. Course may be repeated for credit.  
Permission of instructor.  (F,W,S).

PHYS 499  Laboratory Studies in Physics  1 to 3 Credit Hours  
Experimental studies in physics selected by agreement between student and instructor.  
Four to twelve hours laboratory. Course may be repeated for credit.  
Permission of instructor.  (F,W,S).

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:  
(F) fall term;  (W) winter term;  (S) summer term;  (F, W) fall and winter terms;  (YR) once a year;  (AY) alternating years;  (OC) offered occasionally

Political Science

Political Science, broadly defined, is the study of political power and the ends to which that power is used.  
It is “political” in the sense that it concentrates on the institutions and processes of political systems that exercise power in an authoritative way.  
It is “scientific” in the sense that there is a systematic body of knowledge about political behavior which can be studied empirically, normatively, and experientially.  
But in a broader sense, political science also studies the larger issues of justice and the ways in which the use of political power advances or retards the achievement of justice.

Politics deals with “who gets what,” and political science is the study of that process of getting and maintaining power.  
It is an attempt to define and analyze the processes by which individuals define their interests and interact to promote those interests.  
At the same time it is the study of the moral ends to which power is used.  
The six officially defined areas of specialty within the Bachelor of Arts in Political Science are:  
American Politics, Political Theory, Public Policy, Comparative Politics, International Relations, and Research Methodology.

The Bachelor of Arts in Political Science prepares students for possible careers in public administration; federal, state, and local elected office; public policy analysis; lobbying, journalism, political consulting, law, and graduate work leading to teaching, research, or administration at the university level.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0.  
In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories.  
Please see the General Education Program:  
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits

Humanities and the Arts (GEHA) – 6 Credits

Intersections (GEIN) – 6 Credits

Capstone

Capstone (GECE) – 3 Credits

Foreign Language Requirement

Complete a two-semester beginning language sequence.

Pre-Major Requirements

Students majoring in political science must take two Prerequisites:

Major Requirements

Students must complete 30 credit hours of upper-level political science (POL) courses. Students are advised to complete required classes as soon as possible to prevent schedule conflicts. Those who ignore this advice may have difficulties completing their major requirements as they planned.

Comparative Politics - One course from (CAPO): 3

American Politics - One course from (CAAP): 3

Public Policy - One course from (CAPP): 3

Political Theory - One course from (CAPT): 3
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>POL 450</td>
<td>Revolution</td>
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<tr>
<td>POL 361</td>
<td>American Foreign Policy</td>
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<td>POL 371</td>
<td>Problems in Intl Politics</td>
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<tr>
<td>POL 375</td>
<td>Great Pwrs Comp and Conflict</td>
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<tr>
<td>POL 451</td>
<td>Peace and War</td>
</tr>
<tr>
<td>POL 471</td>
<td>American Foreign Policy I</td>
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<td>POL 472</td>
<td>American Foreign Policy II</td>
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<tr>
<td>POL 473</td>
<td>International Security Affairs</td>
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<tr>
<td>POL 474</td>
<td>Revitalizing Cities</td>
</tr>
<tr>
<td>POL/ENST 487</td>
<td>Comparative Enviro Policy</td>
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</tbody>
</table>

**International Relations - One course from (CAIR):** 3

**Political Analysis:**

- POL/CRJ 300 Political Analysis 3
- POL 4910 Capstone in Political Science 3

**Capstone:**

- POL 4910 Capstone in Political Science 3

**Additional Electives or Concentration to Reach a Total of 30 Credit Hours**

Select any 9 credits of political science (POL) courses at the 300 level or above. Students also have the option to declare a concentration and take 9 credits from one of the following concentrations below:

### Public Law Concentration:

- POL/CRJ 302 The Theory of the Law
- POL/CRJ 316 The American Judicial Process
- POL 318 Criminal Law
- POL/CRJ 413 American Constitutional Law
- POL/CRJ 414 Civil Rights and Liberties
- POL 415 Problems in Constitutional Law
- POL 4165/ CRJ 416 Criminal Law
- POL 417 Constitution & National Security
- POL 418 Supreme Court and Religion

### Public Administration Concentration:

- POL 313 American State Government
- POL 322 Mich Gov, Pol, & Publ Policy
- POL 333 Citizens and Bureaucrats
- POL 334 Organizing and Leadership
- POL 340 Federalism
- POL 363 Cr Just Policy and Admin
- POL/HPS 364 Health Pol and Administration
- POL 367 Fiscal Policy and Budgeting
- POL 490 Sem in Public Administration

### Public Policy Concentration:

- POL 312 Legislative Process
- POL 322 Mich Gov, Pol, & Publ Policy
- POL/ENST/ STS 325 Environmental Politics
- POL 360 American Policy Process
- POL 361 American Foreign Policy
- POL/CRJ/ WGST 362 Women, Politics, and the Law
- POL/HPS 364 Health Pol and Administration
- POL 365 Energy Policy
- POL 367 Fiscal Policy and Budgeting
- POL 4605 Science, Tech & Pub Policy
- POL 466 Politics & Policies Soc Welfare

### POL/ENST 467 Food Politics and Policy

### POL 471 American Foreign Policy I

### POL 472 American Foreign Policy II

### POL 473 International Security Affairs

### POL 484 Revitalizing Cities

### State and Local Concentration:

- POL 313 American State Government
- POL 322 Mich Gov, Pol, & Publ Policy
- POL/CRJ 323 Urban Politics
- POL 334 Organizing and Leadership
- POL 340 Federalism
- POL 484 Revitalizing Cities
- POL 489 Seminar in Urban Politics

### Political Theory Concentration:

- POL/CRJ 302 The Theory of the Law
- POL 303 Justice
- POL 304 American Political Thought
- POL 305 Race/Justice/Freedom in Amer
- POL 306 Political Ideologies
- POL 307 Marxist Thought
- POL/CRJ 308 Moral and Political Dilemmas
- POL 309 Ancient Political Theory
- POL 310 Modern Political Theory
- POL 314 Issues in Amer Pol Thought

### International & Comparative Politics Concentration:

- POL 341 Canadian Politics
- POL 350 Pol of the Developing Areas
- POL/RELS 355 Religion and Politics
- POL 361 American Foreign Policy
- POL 371 Problems in Intl Politics
- POL 375 Great Pwrs Comp and Conflict
- POL 385 Israeli-Palestinian Conflict
- POL 450 Revolution
- POL 451 Peace and War
- POL 471 American Foreign Policy I
- POL 472 American Foreign Policy II
- POL 473 International Security Affairs
- POL/ENST 487 Comparative Enviro Policy

**Total Credit Hours** 30

**Notes:**

1. At least 15 of the 30 upper level credit hours in the Political Science (POL) major must be elected at UM-Dearborn.
2. A maximum of 6 credit hours of POL 494, POL 495, POL 496, POL 497 internship credit may count in the 30 credit hours required for the major.
3. Any one course may be used to satisfy only one requirement within the major.
 Minor or Integrative Studies 
Concentration Requirements 

A minor or concentration consists of 12 credit hours of upper-level courses in political science (POL).

POL 101  American Politics  3 Credit Hours  
This course examines the political institutions and processes of American government. Potential topics include: the Constitution, the Founding, Congress, the Presidency, the Supreme Court, federalism, elections, voting, public opinion, interest groups, political parties, civil rights, civil liberties, or public policy. (F, W).

POL 201  Politics Around the World  3 to 4 Credit Hours  
This course examines the world's major forms of government: democracies and non-democracies, their institutions, and the processes that affect their stability and the transitions between them. (F, W).

POL 205  Intro to Public Administration  3 Credit Hours  
Introductory study of the administrative phase of public policy development. Such aspects of administration as personnel and fiscal management are considered and related to issue of accountability, public responsibility, and notions of public interest. (FW).

POL 250  Intro to Political Theory  3 Credit Hours  
This course examines the role of political theory as a tool for the critical analysis of political reality. It analyzes several dominant political conceptions such as justice, equality, democracy, civility, and authority. (YR).

POL 260  The Arms Race and War  3 Credit Hours  
An examination of the courses and consequences of the contemporary arms race. Special attention is given to nuclear weapons, the risk of war, and the prospect for arms control and disarmament. (YR).

POL 300  Political Analysis  3 Credit Hours  
Introduction to research design, data collection and analysis, sampling, and statistics for social scientists. (F, W).

POL 302  The Theory of the Law  3 Credit Hours  
A comprehensive introduction to the theoretical foundations and the political functions of law, with special emphasis on the different moral justifications of law; the relation between law and justice; the relation between law and freedom; due process and fairness in any legal system. This course is designed to have special relevance for those considering law as a career. (OC).

POL 303  Justice  3 Credit Hours  
An analysis of theories of justice. The relation between morality and political power is considered. (AY).

POL 304  American Political Thought  3 Credit Hours  
The principal American contributions to political theory. (OC).

POL 305  Race/Justice/Freedom in Amer  3 Credit Hours  
This course examines the social and political thought of selected African American political thinkers. Its focus will be to assess the origins, development and implications of their ideas in the context of the changing dynamics of racial politics in America and the world. (AY).

POL 306  Political Ideologies  3 Credit Hours  
An examination of significant modern ideologies, especially liberalism, conservatism, and Marxism. (YR).

POL 307  Marxist Thought  3 Credit Hours  
The theories of selected communist thinkers and the implications that these ideas have for the contemporary world. (OC).

POL 308  Moral and Political Dilemmas  2 to 3 Credit Hours  
The course focuses on the tensions and relations between personal morality and political action by examining the moral aspect of contemporary policy issues such as the right to life, environmental policy, and discrimination. (YR).

Restriction(s):  
Cannot enroll if Class is Freshman or Sophomore

POL 309  Ancient Political Theory  3 Credit Hours  
An examination of seminal ancient and classical thinkers and texts such as Socrates, Plato, Aristotle, and the Bible on significant themes pertaining to justice, government, religion, and philosophy. (YR).

POL 310  Modern Political Theory  3 Credit Hours  
The course studies the origins of modern political theory and practice, and the development of "modern" democratic liberalism. (YR).

POL 311  Int Group and Pol Process  3 Credit Hours  
An examination of the structure, techniques, and internal politics of interest groups, their role in policy making and relationship with political parties, legislative and executive bodies, and administrative agencies. (AY).

POL 312  Legislative Process  3 Credit Hours  
An analysis of legislative systems with emphasis on the changing realities of congressional and state power and policy making. (YR).

POL 313  American State Government  3 Credit Hours  
A comparative analysis of politics, political processes, and governmental institutions in American state and local governments. (YR).

POL 314  Issues in Amer Pol Thought  3 Credit Hours  
Fundamental and recurring issues in American political thought, as they appear in the most influential and representative works on public affairs since the end of the Civil War. Topics may include Social Darwinism and its progressive critics, "revisionist" critiques of the Constitution, political aspects of philosophic pragmatism, the "revolt against formalism" in law, political doctrines of Progressivism and the New Deal, mid-century changes in progressive liberalism, the revival of classical liberalism and its "fusion" with traditional conservatism, political-philosophical aspects of environmentalism, the political thought of the civil rights movement and its critics, feminism and its diversification, and the capacities of American political culture and institutions to conduct a sustained opposition to terrorism. The course concentrates on analyzing extended works of reasoning in books, essays, judicial opinions and other public documents. POL 304, American Political Thought, is recommended as a forerunner to this course.

Restriction(s):  
Can enroll if Level is Undergraduate

POL 315  The American Presidency  3 Credit Hours  
The course examines the expansion of presidential powers, focusing on the constitutional and political development in the president's role as chief executive, legislative leader, and administrative head of state. Topics include: separation of powers, presidential selection, impeachment, relations with Congress and bureaucracy, emergency powers, presidential character, and leadership. (YR).

POL 316  The American Judicial Process  3 Credit Hours  

POL 318  Criminal Law  3 Credit Hours  
A survey of landmark Supreme Court decisions in the field of criminal law and related issues of criminal justice. State court decisions when applicable may also be included. (AY).
POL 320  Politics and Human Nature  3 Credit Hours
An analysis of the political process in terms of the attitudes, values, and behavior of human beings. (OC).
Prerequisite(s): POL 101

POL 322  Mich Gov, Pol, & Publ Policy  3 Credit Hours
This course explores government, politics, and public policy in Michigan. It examines the major governmental and nongovernmental institutions involved in state level policy making, the processes used by these institutions to influence public policy, and the policies that emerge through their interaction. (YR).

POL 323  Urban Politics  3 Credit Hours
A survey of the political process in urban areas giving special attention to the changing role of cities in American politics. (YR).

POL 325  Environmental Politics  3 Credit Hours
An examination of policy making about problems affecting the environment, at a global, national, and local scale. (AY).

POL 326  Presidential/Congress Election  3 Credit Hours
This course will focus on the most recent and upcoming presidential and congressional elections from the perspective of how they fit into and help illustrate the broad theoretical frameworks and findings on elections and voting behavior in political science. Topics will include nominating and general election campaigns, campaign financing, participation, party coalitions, and news media. (OC).
Prerequisite(s): POL 101

POL 327  Pol Parties and Elections  3 Credit Hours
A basic survey of American political party organization and the American election system. The course sometimes includes an examination of parties and elections in comparative perspective. (YR).

POL 328  Pub Opinion and Press Groups  3 Credit Hours
A study of the nature and formation of public opinion, the techniques for its measurement, and its role in the political system. (AY).

POL 329  Politics and the Media  3 Credit Hours
This course investigates the relationships between the news media and our major political institutions; the structure of the modern media; their influence on public opinion; their effects on our party and electoral system; their role in defining political reality and agenda setting; and their influence upon our political institutions and the policy-making process. (YR).

POL 333  Citizens and Bureaucrats  3 Credit Hours
The focus of this course is citizen participation in administrative behavior. Attention is paid to the perspectives of both citizens and bureaucrats. The course uses broad concepts of political participation and organization behavior. (YR).

POL 334  Organizing and Leadership  3 Credit Hours
The purpose of this course is to introduce students to the theory and practice of local democratic action. The course draws on the history, practices, and lessons of the American community organizing tradition and the civil rights movement and relates those past experiences to current issues. In collaboration with local community partners, students learn about effective methods of civic engagement and leadership, as currently practiced in metropolitan Detroit.

POL 340  Federalism  3 Credit Hours
Federalism is considered from both legal and operational perspectives. Students examine traditional views of Federalism as well as empirical and technical studies about intergovernmental relations at national, state, and metropolitan levels. (YR).

POL 341  Canadian Politics  3 Credit Hours
A survey of Canadian politics and government. It provides an understanding of the Canadian political tradition and some of the concerns of contemporary Canada; includes a focus on the cultural and socioeconomic bases of the political system, the development of constitutional structures, the scope of public policy and the dynamics of policy process. (OC).

POL 350  Pol of the Developing Areas  3 Credit Hours
A comparative study of political development, political and governmental structures, and conflict patterns, especially of an ethnic nature. (AY).

POL 355  Religion and Politics  3 Credit Hours
The primary focus of the course is on political movements or systems that take a religious form or have a religious base or use a religiously-rooted ideology. Possible themes or cases covered include the Catholic Church as a political system, Evangelical politics in America, religious uprisings, and Islamic political movements. (AY).

POL 360  American Policy Process  3 Credit Hours
An analysis of political decision-making processes on a range of issues with an emphasis on how various political actors attempt to influence the process to their own advantage. (YR).

POL 361  American Foreign Policy  3 Credit Hours
Survey of American foreign policy in various regions of the world. Instances of policy making, such as the Cuban missile crisis, are explored in detail. (YR).

POL 362  Women, Politics, and the Law  3 Credit Hours
An examination of the political behavior of women in American politics. Included is an analysis of the legal and legislative demands of American women. (AY).

POL 363  Cr Just Policy and Admin  3 Credit Hours
The structure and processes of criminal justice administration in America, including analysis of current issues in police behavior, courts, and corrections. (AY).

POL 364  Health Pol and Administration  3 Credit Hours
Structure and processes of health administration in America, including analysis of current issues in health policy. (AY).

POL 365  Energy Policy  3 Credit Hours
The course reviews the important elements in energy policy and a brief history of that development. It also considers what factors have been important in those developments. Finally, there is discussion of the potential for policy developments at all levels of government. (OC).

POL 367  Fiscal Policy and Budgeting  3 Credit Hours
This course is intended to introduce students to the fundamental elements of the federal budget. During the class we will examine the budgetary process and how it has evolved over time. Contemporary proposals to reform the budget process will be considered as well. Careful attention will also be paid to important components of the federal budget including entitlements, defense spending, and discretionary non-defense spending. We will consider various policy reforms as legislators seek to find ways of maintaining popular programs while controlling costs. Finally, the course will conclude by examining some famous budgetary conflicts in recent American history.

Restriction(s):
Can enroll if Level is Undergraduate
POL 370  Communist & Post-Communist Sys  3 Credit Hours
China and Russia are the focal points of this course. Among questions explored are: How are Russia and China ruled? Are their forms of government and their economic systems "moderating" and becoming more like those of the United States? How successful have these governments been in meeting the needs of the people? (OC).

POL 371  Problems in Intl Politics  3 Credit Hours
Present-day problems in world politics, with particular emphasis on the great powers and on areas and events of political conflict in the contemporary world. (YR).

POL 375  Great Pwrs Comp and Conflict  3 Credit Hours
This course focuses on the foreign policies of major international powers, such as China, Russia, and the Western European democracies. Attention is also paid to the causes of the rise and decline of major powers. (YR).

POL 385  Israeli-Palestinian Conflict  3 Credit Hours
The course focuses on the Israeli-Palestinian conflict in its domestic, regional, and world-wide dimensions. (W, YR).

POL 390  Topics in Political Science  3 Credit Hours
Examination of problems and issues in selected areas of political science. Title as listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

POL 390J  Topics in Political Science  3 Credit Hours
Topic: Freedom of Religion in America. This course is designed to explore a variety of historical and contemporary issues dealing with freedom of religion as guaranteed in the First Amendment of the Bill of Rights. Special attention will be given to the landmark decisions of the Supreme Court interpreting the Establishment and Free Exercise clauses of the First Amendment and the legal and political controversies raised by these decisions. The course is designed to lead to a greater understanding of the symbiotic relationship between religion and politics, the importance of religious liberty to democracy, and the inevitable tensions between religious groups, and between church and state in a free society.
Prerequisite(s): HIST 365

POL 398  Independent Studies  1 to 3 Credit Hours
Readings or analytical assignments in Political Science in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor.

POL 399  Independent Study  1 Credit Hour
Readings or analytical assignments in political sciences in accordance with the interests and needs of students enrolled and agreed upon by the instructor and student. Written permission of instructor required.

POL 413  American Constitutional Law  3 Credit Hours
A major theme of this course is the development of the Constitution as shaped by the Supreme Court, Congress, and the president. The course examines the constitutional interpretation of government authority which includes such topics as judicial review, appointments, executive privilege, war power, federalism, commerce power, taxing and spending power, and substantive due process. (AY).
Restriction(s):
Cannot enroll if Class is

POL 414  Civil Rights and Liberties  3 Credit Hours
An analysis of the Bill of Rights and the 14th Amendment, with particular emphasis upon recent landmark or controversial Supreme Court decisions dealing with freedom of speech and religion, rights of criminal defendants; cruel and unusual punishment, right to privacy; civil rights and equal protection clause; and apportionment. (YR).
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

POL 415  Problems in Constitutional Law  3 Credit Hours
Selected areas of constitutional law of current interest. Topics to be announced. (AY).
Restriction(s):
Can enroll if Class is Junior or Senior

POL 4165  Criminal Law  3 Credit Hours
A survey of the major judicial, executive, and legislative decisions in the field of criminal law. (AY).

POL 417  Constitution & National Security  3 Credit Hours
This course focuses on the issue of national security and how the federal government has used power to protect its citizens. It analyzes relevant national security issues in order to understand how government action is constrained by the Constitution and social norms. The course examines the historical development of national security in the United States including habeas corpus, wiretapping, military tribunals, state secrets, and extraordinary rendition. Particular close attention is paid to the modern development of national security. The emphasis in reading will be on cases, executive orders, congressional hearings, and statutes. For graduate credit elect POL 517.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 418  Supreme Court and Religion  3 Credit Hours
A study of the major landmark decisions of the Supreme Court interpreting First Amendment guarantees of religious liberty. The course emphasizes case law defining the meaning of the Establishment Clause and the Free Exercise Clause and their significance for religious liberty in America.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 445  Environmental Law  3 Credit Hours
A survey of common law theories and analysis of environmental statutes from a functional perspective. The course also includes environmental law aspects of constitutional law, administrative law and criminal law, as well as the public trust doctrine and public lands. Student cannot receive credit for both ENST 350 and ENST/POL 445.

POL 450  Revolution  3 Credit Hours
A consideration of violent political change and the conditions which promote it. The course covers both revolutionary theories and empirical research. Specific revolutions are considered. (YR).
Restriction(s):
Cannot enroll if Class is

POL 451  Peace and War  3 Credit Hours
An examination of the causes of war and the means of securing peace. (YR).
Prerequisite(s): HIST 365 or HONS 300
Restriction(s):
Cannot enroll if Class is
Can enroll if Attribute is Honors Program
POL 460 Science, Tech & Pub Policy 3 Credit Hours
This course explores the intersection of science, technology, and public policy. Scientific knowledge and technological innovations are exceptionally powerful resources for policy-makers and for societies; they also pose great challenges and risks. This course will look at how science and technology affect the pursuit of policy goals in areas such as public health, environmental sustainability, economic growth, and national security. Students will not receive credit for more than one of POL 460, POL 560, and PPOL 560.

Restriction(s):
Cannot enroll if Class is Graduate

POL 466 Politics & Policies Soc Welfare 3 Credit Hours
The course examines the relationship between politics and public policy as related to the provision of social welfare programs in the United States.

Restriction(s):
Cannot enroll if Class is Freshman

POL 467 Food Politics and Policy 3 Credit Hours
How do politics affect our food at the global, national and urban/local scale? This course examines close historical relationships between politics and food; the politics of conventional agriculture and food policy; and alternative agriculture movements and food systems, with a particular emphasis on urban food policy and urban food systems.

POL 471 American Foreign Policy I 3 Credit Hours
American foreign policy in Western Europe, Russia, and Latin America. (OC).

Restriction(s):
Can enroll if Class is Junior or Senior

POL 472 American Foreign Policy II 3 Credit Hours
American foreign policy in the non-western world. (OC).

Restriction(s):
Can enroll if Class is Junior or Senior

POL 473 International Security Affairs 3 Credit Hours
International Security is the branch of world politics concerned with the threats, primarily military in nature, to the peace and security of the nation, states, and the international community. (AY).

Restriction(s):
Can enroll if Class is Junior or Senior

POL 481 Terrorism & US Natl Security 3 Credit Hours
The United States responded to the events of September 11, 2001 with a series of unprecedented action under the umbrella of homeland security and the War on Terror? This course examines American National security policy by asking a few key questions: What is terrorism and how does it threaten the United States? How has the United States responded to the threat of terrorism over time? What have the consequences of US policy been to date? Finally, how would we balance a desire for security with our desire for civil liberties and ethical action?

Prerequisite(s): CRJ 468

Restriction(s):
Can enroll if Level is Undergraduate

POL 484 Revitalizing Cities 3 Credit Hours
What have we done to address decline in city neighborhoods and downtowns? Why? How has it worked? Why? What’s the hope for the future? This course uses a public policy lens to engage students in a quest for answers to these questions. (YR)

POL 487 Comparative Enviro Policy 3 Credit Hours
This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages - from defining an issue as an environmental problem to placing it on political agenda and then receiving a response at domestic governmental or international levels. This course analyzes environmental issues from a cross-cultural and comparative perspective, with a particular attention given to political institutions, political change, levels of development, political culture, public participation, and international commitments that shape the nature and dynamics of environmental politics and policy in different countries. Course POL 101 is recommended before taking this course.

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

POL 489 Seminar in Urban Politics 3 Credit Hours
Selected topics in urban politics.

POL 490 Seminar in Public Administration 2 to 3 Credit Hours
Selected topics in public administration.

POL 491 Seminar in Political Science 3 Credit Hours
Selected topics in political science. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when topics differ. (AY).

POL 492 Seminar in Political Analysis 3 Credit Hours
An advanced in-depth look at the problems and techniques of empirical research. Gives special attention to research design, data collections, measurement, and validity. Statistics for social scientists will also be covered. (OC).

POL 494 Internship Seminar 3 Credit Hours
This is the academic part of the internship. Students meet with other interns once a week to analyze political dynamics within their placements. Students are required to keep journals, prepare papers and reports, and do other written work. Anyone taking POL 495 or 497 is required to take POL 494. It may not be taken by itself. Repeatable if topic differs. Only six hours of internship credit is allowable toward concentration requirement.

POL 495 Public Affairs Internship 3 to 6 Credit Hours
Field study placements in national, state, county, local government or private agencies. Primarily for junior or senior political science concentrators or other qualified applicants. Maximum of 20 students selected each term. Students must also register for POL 494. Only six hours of internship credit is allowed toward concentration requirement.

POL 496 Canada Internship 3 or 6 Credit Hours
Field study placements in Canada at national, provincial, or local levels, or in private agencies. Course is offered only in spring semester. Primarily for junior or senior political science concentrators, or other qualified applicants. Students must also register for POL 494. Only six hours of internship credit is allowed toward concentration requirement.
Professional Language and Cross-Cultural Competency

Modern and Classical Languages offers a certificate which is designed to advance linguistic proficiency while at the same time develop cross-cultural competency and sharpen critical thinking skills.

Certificate Requirements

11 credit hours required in one of the following languages: Arabic, French, German, Spanish. All courses must be in a single language.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARBC 201</td>
<td>Intermediate Arabic I</td>
<td>4</td>
</tr>
<tr>
<td>or FREN 201</td>
<td>Intermediate French I</td>
<td></td>
</tr>
<tr>
<td>or GER 201</td>
<td>Intermediate German I</td>
<td></td>
</tr>
<tr>
<td>or SPAN 201</td>
<td>Intermediate Spanish I</td>
<td></td>
</tr>
<tr>
<td>ARBC 202</td>
<td>Intermediate Arabic II</td>
<td>4</td>
</tr>
<tr>
<td>or FREN 202</td>
<td>Intermediate French II</td>
<td></td>
</tr>
<tr>
<td>or GER 202</td>
<td>Intermediate German II</td>
<td></td>
</tr>
<tr>
<td>or SPAN 202</td>
<td>Intermediate Spanish II</td>
<td></td>
</tr>
<tr>
<td>ARBC 305</td>
<td>Language of Business</td>
<td>3</td>
</tr>
<tr>
<td>or FREN 305</td>
<td>Language of Business</td>
<td></td>
</tr>
<tr>
<td>or FREN 306</td>
<td>Cult Intro to French Business</td>
<td></td>
</tr>
<tr>
<td>or GER 305</td>
<td>German for the Professions</td>
<td></td>
</tr>
<tr>
<td>or GER 306</td>
<td>Cross-Cult Comptncy&amp;Professns</td>
<td></td>
</tr>
<tr>
<td>or SPAN 305</td>
<td>Language of Business</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 11

If foreign language placement is 202 or above, 305/306 will be required and additional courses that focus on culture and/or professional topics from the following to total minimum of 11 credits:

ARBC 332, 350, 351
FREN 336, 337, 338, 339, 375 or 388
GER 376, 377
SPAN 321, 356, 357, 353, 358, 450, 451, 465

Notes:
1. No courses may be taken as pass/fail.
2. A 3.0 GPA in the courses within the certificate is required.
3. Certificate GPA can be shared with a major, or minor, or other certificate.

Psychology

As the science of behavior and psychological processes, psychology has a vast range. At one end, it borders on natural sciences such as biology and physiology, and at the other, it shares interests with social science disciplines such as anthropology and sociology. With the goal of understanding, predicting, and modifying behavior and psychological processes, psychologists must include in their studies a variety of perspectives.

The Bachelor of Arts in Psychology at UM-Dearborn is designed to accommodate non-majors who seek personal enrichment, majors who will go on to psychology in a human services career or in a related field, and majors intending to pursue an advanced degree in psychology. The Program thus includes courses in the following areas:

- Natural Science (learning and memory, sensation and perception, physiology)
- Cognitive (thinking, problem solving, and language)
- Developmental (the process of human growth)
- Social (the influence of groups)
- Clinical/Abnormal (understanding and treating people with psychological disorders)
- Industrial/Organizational (applying psychological principles to the work place)

Psychology provides direct training for employment in four major areas. It can be applied to careers:

- promoting individual health (clinical psychology, counseling psychology, community psychology, health psychology)
- in educational settings (school psychology, college teaching)
- in business settings (industrial and organizational psychology, engineering psychology, consumer psychology)
- in the public domain (environmental psychology, law and psychology, psychology and public police)

Psychology is also an excellent preparation and aid for careers in such fields as medicine, law, business, education, and social work. Honors and internship programs provide opportunity for students to develop research skills and to gain practical experience in an applied setting.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.
Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)
Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)
Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
- Lecture/Lab Science Course
- Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)
Humansities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)
Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

Pre-Major Requirement
Students desiring to major in psychology are required to take the following or their equivalent.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology (upper level PSYC courses require a minimum grade of C- in PSYC 101)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours

Major Requirements
Students must complete at least 31 credit hours in psychology (PSYC) at the upper level (300 level or above). For those transferring from a community college this requirement will mean that the 31 credit hours will be completed during the junior and senior years.

Students are required to take one course in each of the following areas.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 415</td>
<td>Lab in Developmental Psych</td>
<td>4</td>
</tr>
<tr>
<td>PSYC/CRJ 425</td>
<td>Lab in Social Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 4445</td>
<td>Personality Assessment Lab</td>
<td></td>
</tr>
<tr>
<td>PSYC 465</td>
<td>Experimental Psychology</td>
<td></td>
</tr>
</tbody>
</table>

Biological Psychology (CABP)
Select one course from the following:
- PSYC 370 Physiological Psychology
- PSYC 372 Animal Behavior
- PSYC 455 Health Psychology
- PSYC 4725 Motivation and Behavior

Clinical/Personality (CACP)
Select one course from the following:
- PSYC/CRJ 440 Abnormal Psychology
- PSYC 441 Intro to Clinical Psychology
- PSYC 442 Child Psychopathology
- PSYC 450 Personality Theory

Developmental Psychology (CADP)
Select one course from the following:
- PSYC 300 Life-Span Developmental Psych
- PSYC 301 Psych of Infant Development
- PSYC 302 Psych of Child Development
- PSYC 315 Personality Development
- PSYC/CRJ 407 Psychology of Adolescence
- PSYC 412 Psychology of Aging
- PSYC 418 Cognitive Development
- PSYC 432 Socialization of the Child

Social/Organizational Psychology (CASP)
Select one course from the following:
- PSYC 320/CRJ 382/SOC 382 Social Psychology
- PSYC/AAAS/CRJ 322 Psychology of Prejudice
- PSYC/CRJ 325 Psyc of Interpersonal Relation
- PSYC 426 Applied Social Psychology
- PSYC 4305 Psychology in the Workplace
Statistics and Experimental Design

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 381</td>
<td>Prin of Stat and Exper Design (must be taken before Methods course)</td>
<td>3</td>
</tr>
</tbody>
</table>

Cognitive (CAPC)

Select one course from the following: 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 363</td>
<td>Cognitive Psychology</td>
</tr>
<tr>
<td>PSYC/LING 375</td>
<td>Psychology of Language</td>
</tr>
<tr>
<td>PSYC 461</td>
<td>Learning and Memory</td>
</tr>
<tr>
<td>PSYC 463</td>
<td>Sensation and Perception</td>
</tr>
<tr>
<td>PSYC/STS 464</td>
<td>Applied Cognitive Psychology</td>
</tr>
<tr>
<td>PSYC 474</td>
<td>Animal Learning and Cognition</td>
</tr>
</tbody>
</table>

Electives in Psychology

Select 9 credits any upper-level psychology (PSYC) to equal 30 total credits: 9

Total Credit Hours 31

Cognates

Students must also complete at least six credit hours in cognate courses at the upper level (300 level or above), (excluding co-ops, internships or independent studies), from: any CASL discipline (excluding psychology); College of Business disciplines; College of Engineering and Computer Science disciplines; College of Education, Health, and Human Services (EDA and EDC Education disciplines only).

Notes:

1. A maximum of 54 credit hours in Psychology (PSYC) may count in the 120 hours required to graduate (excluding PSYC 498 and PSYC 499 for PSYC Honors students).
2. At least 15 of the 31 upper level credit hours in PSYC must be elected at UM-Dearborn.
3. No more than 6 credit hours of Independent Study and no more than 6 credit hours of Independent Research within the Behavioral Sciences (anthropology (ANTH), psychology (PSYC) and sociology (SOCI)) may be counted in the 120 credit hours required to graduate.

Honors Program in Psychology

Psychology offers an honors program which provides special opportunities for outstanding students, including a research training seminar followed by research in collaboration with faculty members. Students are formally accepted for the honors program early in their junior year. Prospective students should plan on completing PSYC 381 and a Methods course by the end of fall term in their junior year. Requirements for entrance are: a) GPA of 3.2 or higher in psychology and overall UM-Dearborn courses, and b) informal evidence of being a superior student, such as high motivation and ability to work independently. Requirements for graduation with honors in psychology are the successful completion of:

- All requirements for the psychology major
- PSYC 481 Computers in Psychology, normally taken in the fall semester, senior year
- PSYC 498 Honors Seminar normally taken winter term, junior year
- PSYC 499 Honors Research normally completed during senior year
- Research proposal meeting completed early in senior year
- Final Oral Defense completed at least one month prior to graduation

Psychology Internship

Juniors and seniors can obtain practical experience working under supervision in a setting relevant to psychology. Internship students will spend approximately 6 or 12 hours per week at their field placement and will attend a weekly seminar on campus. Students may register for PSYC 485 Psychology Internship for 3 or 6 credits. Application should be made to the director of the psychology internship program.

Minor or Integrative Studies

Concentration Requirements

A minor or concentration consists of PSYC 101 and 12 credit hours of upper-level courses in psychology (PSYC). Upper-level PSYC courses require a minimum grade of C- in PSYC 101.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 170</td>
<td>Intro to Psych as a Nat Sci</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 171</td>
<td>Intro to Psych as a Soc Sci</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 215</td>
<td>Research Skills BSci</td>
<td>1</td>
</tr>
<tr>
<td>PSYC 299</td>
<td>Careers in Psychology</td>
<td>1</td>
</tr>
<tr>
<td>PSYC 300</td>
<td>Life-Span Developmental Psych</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite(s): PSYC 101 or PSYC 170 or PSYC 171
PSYC 301  Psych of Infant Development  3 Credit Hours
An examination of current theories and findings concerning physical, social, emotional, and intellectual development of the infant. Topics include genetic and experiential factors affecting prenatal and infant development. Language, cognition, and environmental influences on development. Theory will be related to infant care practices in families.  
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 302  Psych of Child Development  3 Credit Hours
An examination of current theories and findings concerning physical, social, emotional, and intellectual development from conception to late childhood. Topics include genetic and experiential factors affecting child development.  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 303  Intro to Women's & Gender Stud  3 Credit Hours
This course provides an interdisciplinary overview of the key theories and topics in Women's and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women's and men's lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.  
Restriction(s):
Cannot enroll if Class is Freshman

PSYC 315  Personality Development  3 Credit Hours
An investigation of the factors involved in the formation of personality and the changes in personality across the life-span. The influence of family, peers, and society will be emphasized. (YR).  
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 320  Social Psychology  3 Credit Hours
An introductory study of the inter-relationships of the functioning of social systems and the behavior and attitudes of individuals. (YR).  
Prerequisite(s): PSYC 101 or PSYC 170 or PSYC 171

PSYC 321  Attitude and Social Behavior  3 Credit Hours
An analysis of social attitudes as they relate to personality and to membership in collective structures; the conditions of their formation and modification. (YR).  
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 322  Psychology of Prejudice  3 Credit Hours
A consideration of ethnic (including racial), sexual, and religious prejudice from the psychological point of view, focusing on the mind of both the oppressor and the oppressed. (YR).  
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 325  Psyc of Interpersonal Relation  3 Credit Hours
This course presents an overview of theory and research conducted by social psychologists that has been aimed at understanding interactions between individuals. Topics include an exploration of the research process that is used to investigate interpersonal relationships, the processes underlying social perception, friendship, liking, love, close relationships, aggression and violence in interpersonal relationships. (YR).  
Prerequisite(s): PSYC 101 or PSYC 170 or PSYC 171

PSYC 335  Psychology of Bilingualism  3 Credit Hours
This course is an introduction to the study of bilingualism with a focus on biological and cognitive aspects of bilingualism. Topics covered include definitions and types of bilingualism; differences between monolinguals and bilinguals; language development in children and adults and differences between early and late learning; brain areas involved using one and multiple languages; language processing in bilinguals, including topics such as working memory, executive control, proficiency, age of acquisition, and language attrition; and the relationship between language, thought, and culture. We will also discuss social aspects of bilingualism, including heritage language, identity, and attitudes. (F,W)  
Prerequisite(s): PSYC 101

PSYC 363  Cognitive Psychology  3 Credit Hours
Analysis of human perceptual and cognitive functioning from an information-processing point of view. Emphasis will be placed on attention, pattern-recognition, memory, problem solving and other cognitive processes. (YR).  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 370  Physiological Psychology  3 Credit Hours
Integration of physiological concepts with behavioral phenomena. (YR).  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 372  Animal Behavior  3 Credit Hours
Comparative psychology. Descriptive analysis of human and animal behavior. (YR).  
Prerequisite(s): PSYC 170 or PSYC 171 or BIOL 100 or PSYC 101

PSYC 375  Psychology of Language  3 Credit Hours
The nature of human language as seen from the perspective of experimental psychology. The course will also introduce the student to current developments in linguistics theory. (AY).  
Prerequisite(s): PSYC 170 or PSYC 171 or LING 280 or PSYC 101

PSYC 381  Prin of Stat and Exper Design  3 Credit Hours
An introduction to basic principles of experimental design and statistical analysis as employed in psychological research. Topics covered include data-gathering, descriptive statistics, hypothesis-testing and one- and two-sample experiments, correlational designs, and one- and two-way analysis of variance. (YR).  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 390  Topics in Psychology  3 Credit Hours
Examination of problems and issues in selected areas of psychology. Title listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 391  Topics in Psychology  3 Credit Hours
Examination of problems and issues in selected areas of psychology. Title listed in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 394  Psychology and Theater  3 Credit Hours
The linkages between psychology and theater are analyzed from the perspective of the actor, the audience, and the analyst (both psychotherapeutic and literary). This includes ties between plays and theories of human behavior, psychodrama, and self-insight through performance. Class involves a significant experiential component.  
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
PSYC 3955 Diversity and the Workplace 3 Credit Hours
This course will: 1) discuss gender, race, ethnicity, disability, age, sexual orientation, and appearance as aspects of diversity; 2) examine social values and practices, and organizational policies and procedures that affect or have affected the employment opportunities of underrepresented groups; 3) examine individual (e.g., prejudice, stereotypes), group (e.g., in-groups and out-groups), and organizational (e.g., climate and culture) processes that affect work place diversity; and 4) discuss "best practices" for promoting an organizational culture that values diversity, along with a diverse work force.
Prerequisite(s): PSYC 170 or PSYC 171 or WST 275 or OB 354 or HRM 405 or WGST 275 or WGST 303 or PSYC 275 or ANTH 275 or SOC 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303 or PSYC 101

PSYC 398 Independent Studies in Psych 1 to 3 Credit Hours
Readings or analytical research in psychology selected in accordance with the interests and needs of students enrolled and agreed upon by the instructor and student. Permission of instructor. (F,W,S).

PSYC 400 Cognitive Neuroscience 3 Credit Hours
Cognitive neuroscience focuses on the fundamental question of how our nervous system, especially the brain, supports our (generally-defined) cognitive function, such as sensory/perception, learning/memory, language social/emotion, and executive functions. This is a fast-growing inter-disciplinary research field that bridges psychology and neurobiology. In this course, we will discuss the recent advances in these cognitive neuroscience subfields and learn how various brain systems may play unique roles in supporting these distinct functions. We will also discuss important research methods/techniques used in cognitive neuroscience, such as the functional Magnetic Resonance Imaging (fMRI), Electro/Magnetoencephalography (EEG/MEG), intracranial recording, and brain damage/lesion/stimulation methods, and related research paradigms and resulted theories. Students will also learn to read and criticize cognitive neuroscience research articles. Gross neuroanatomy will be introduced to provide a foundation for understanding systems and interconnectedness of the brain and related cognitive processing.
How cognitive neuroscience can help us better understand normal and pathological psychological functions will be discussed. (F)
Prerequisite(s): (PSYC 170 or PSYC 171 or PSYC 101) and (PSYC 363 or PSYC 375 or PSYC 461 or PSYC 463 or PSYC 464)

PSYC 404 Parent-Child Relations 3 Credit Hours
This course examines parental effects on children and children's effects on parents. Emphasis is placed on how the psychologist can collect additional information on the interactions of such people as parents and their children. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 405 Gender Roles 3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Students cannot receive credit for both PSYC 405 and PSYC 505. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or SOC 200 or SOC 201 or PSYC 101
Restriction(s):
Cannot enroll if Class is Graduate

PSYC 407 Psychology of Adolescence 3 Credit Hours
Considers adolescence as an interaction of rapid biological and social change. Students lacking the prerequisite may elect course with permission of instructor. Examines the theoretical and empirical literature in some detail. Students cannot receive credit both both PSYC 407 and PSYC 507. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 412 Psychology of Aging 3 Credit Hours
This course examines development of the individual from middle adulthood through old age. Special emphasis is given to the understanding of developmental theories and issues in adulthood. Topics include biological basis, socialization, family relationships, personality, and intellectual development in the aging individual. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 415 Lab in Developmental Psych 3 Credit Hours
An examination of research design and methodology as related to developmental psychology. Special emphasis will be given to training students in data collection techniques used in developmental research and in providing practical experience in designing and conducting research. Students cannot receive credit for both PSYC 415 and PSYC 515. (YR).
Prerequisite(s): (PSYC 300 or PSYC 301 or PSYC 303 or PSYC 407 or PSYC 412) and PSYC 381

PSYC 418 Cognitive Development 3 Credit Hours
This course explores theories and methods in cognitive development focusing on Piaget’s theory and more recent significant conceptualizations. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 421 Group Processes 3 Credit Hours
Topics treated include group cohesiveness, “group think,” the social structure of groups, emotional factors in group life, leadership, and the development of groups. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or PSYC 101

PSYC 422 Psychology of Leadership 3 Credit Hours
Analysis of theories and research findings in the field of leadership. Class will participate in and observe leadership-group interactions. Students cannot receive credit for both PSYC 422 and PSYC 522. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 425 Lab in Social Psychology 4 Credit Hours
A broad introduction to research methods in basic and applied social psychology. Students will receive training in construction, implementation, and interpretation of scientific procedures used in the study of social psychology. Topics include: questionnaire construction, experimental design, and various multivariate analytic techniques. (YR).
Prerequisite(s): PSYC 381
PSYC 426  Applied Social Psychology  3 Credit Hours
The field of Applied Social Psychology utilizes social psychological theory and research to understand social problems with the goal of improving social conditions. This course will examine social issues from both macro (social institutions and policies) and micro (interpersonal/intergroup behaviors and beliefs) perspectives. We will investigate how social institutions such as social policy, mass media, and education impact individuals, families, communities, and the environment. (YR)
Prerequisite(s): (PSYC 101 or PSYC 170 or PSYC 171) and (PSYC 320 or SOC 382 or CRJ 382)
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 427  Media Psychology  3 Credit Hours
Media Psychology is the branch of psychology that focuses on the psychological processes associated with media, technology use and the impact that these have on individuals and society. This seminar class will provide an in-depth examination of research methods and psychological theories related to persuasion, media effects, media identification and media participation. Research across several content areas including aggression, prosocial behavior, health and well-being, risky behaviors, relationships, news and politics, as well as media literacy, will also be considered. (YR)
Prerequisite(s): (PSYC 101 or PSYC 170 or PSYC 171) and (PSYC 320 or SOC 382 or CRJ 382)

PSYC 428  Self & Identity  3 Credit Hours
This course provides an in-depth exploration of the vast body of research concerning psychological perspectives on the self and identity. Through reading academic journal articles pertaining to theories and research findings about the self and identity, students will learn about a) the structure and components of self and identity, b) self-knowledge and self-assessment, c) self-damage, d) self-protection and self-enhancement, and e) aspects of the psychologically healthy self.
Prerequisite(s): PSYC 101 or PSYC 170 or PSYC 171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

PSYC 4305  Psychology in the Workplace  3 Credit Hours
This course introduces students to some of the core content areas of Industrial/Organizational (I/O) psychology. These content areas include: selection, training, performance appraisal, work teams, job design, motivation, leadership, union-management relations, and stress and health in the workplace. Students cannot receive credit for both PSYC 4305 and PSYC 530. (YR)
Prerequisite(s): PSYC 171 or PSYC 170 or OB 354 or PSYC 101

PSYC 431  Organizational Entry  3 Credit Hours
An in-depth consideration of the psychological aspects of the organizational entry process. Topics to be covered include recruitment, selection, orientation, socialization, and training. (OC).
Prerequisite(s): PSYC 170 or PSYC 171 or HRM 405 or OB 354 or PSYC 101
Restriction(s):
Cannot enroll if Class is Graduate
Can enroll if Level is Undergraduate

PSYC 432  Socialization of the Child  3 Credit Hours
An in-depth consideration of some major social systems that affect the development of the child. Students lacking the prerequisite may elect course with permission of instructor. Students cannot receive credit for both PSYC 432 and PSYC 532. (YR)
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior

PSYC 440  Abnormal Psychology  3 Credit Hours
An introduction to the field of psychopathology, the study of mental disorders. Includes exposure to a number of historical and theoretical perspectives, each with their own theories, methodologies, and treatment approaches. Disorders covered will include: anxiety and mood disorders, personality disorders, schizophrenia, sexual disorders, and psychosomatic disorders. Students cannot receive credit for both PSYC 440 and PSYC 540. (YR)
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 441  Intro to Clinical Psychology  3 Credit Hours
Introduction to the logic, problems, and limitations of clinical observations and inference. Issues in diagnosis and treatment are examined, with an attempt to understand parallels between clinical interpretation and problems in other disciplines. (YR)
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 442  Child Psychopathology  3 Credit Hours
A review of the major psychological disorders of children from birth to adolescence. These disorders are considered from a clinical and theoretical point of view. In addition to an examination of causes, approaches to treatment and behavior modification are considered. Students cannot receive credit for both PSYC 442 and PSYC 542. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Cannot enroll if Class is

PSYC 4445  Personality Assessment Lab  4 Credit Hours
This is a course in methods of assessing personality. The theory and methods of observation, interviewing, questionnaires, IQ tests, and projective tests are discussed and employed in brief individually-designed studies. In addition to the course prerequisite, students should have at least three upper-level psychology credits and junior or senior standing or permission of the instructor. Students cannot receive credit for both PSYC 4445 and PSYC 544. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior

PSYC 446  Human Sexual Behavior  3 Credit Hours
A comprehensive review of facts about human sexuality. The emphasis is on psychological aspects of sex, but there is also a consideration of genetic, physiological, and anatomical aspects of sex, and contemporary issues. Students cannot receive credit for both PSYC 446 and PSYC 546. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101

PSYC 450  Personality Theory  3 Credit Hours
A comparative review and examination of leading theories of personality; their basic concepts, similarities and differences, applications in clinical psychology, in education, in social planning, and in research. Students cannot receive credit for both PSYC 450 and PSYC 550. (YR).
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101
PSYC 451  Prin of Counseling and Psych  3 Credit Hours
An introduction to traditional and innovative methods of psychological counseling and psychotherapy with an emphasis upon the theoretical foundations of personality and behavior change. Differences and similarities among the various schools of counseling and psychotherapy will be examined among with the values and limitations common to them all. (YR).
Prerequisite(s): PSYC 170 or PSYC 170 or PSYC 101

PSYC 455  Health Psychology  3 Credit Hours
A discussion of the research on health promotion, psychological factors in the development of illness, cognitive representations of health and illness, stress and coping, social support, nutrition and exercise. Focus will be on the factors related to the development and maintenance of optimal health. Students cannot receive credit for both PSYC 455 and PSYC 555. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Cannot enroll if Class is

PSYC 456  Sport Psychology  3 Credit Hours
A consideration of research and theory aimed at two objectives: (a) understanding how psychological variables affect physical performance and (b) understanding how participation in sports influences psychological development. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 457  Positive Psychology  3 Credit Hours
This course examines the contemporary movement of positive psychology, which uses the tools of rigorous science to explore the sources and nature of human strengths and psychological well-being. It then seeks to apply this knowledge to help individuals and institutions function more effectively. Topics include the biological basis of positive emotions, resilience and post-traumatic growth, positive relationships, positive education, positive workplaces, and positive development across the lifespan. (YR)
Prerequisite(s): PSYC 101

PSYC 461  Learning and Memory  3 Credit Hours
A consideration of major theories and research results related to learning and memory in humans and animals. Students cannot receive credit for both PSYC 461 and PSYC 561. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 463  Sensation and Perception  3 Credit Hours
Analysis of basic sensory and perceptual phenomena with a review of relevant behavioral and physiological literature. Students cannot receive credit for both PSYC 463 and PSYC 563. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 464  Applied Cognitive Psychology  3 Credit Hours
The focus will be on the application of principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language.
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 465  Experimental Psychology  4 Credit Hours
Laboratory course in Experimental Psychology, including sensation, perception, learning, memory, language, and problem solving. Students will perform standard experiments, design one or two new modified experiments, collect data, analyze results, and present them in the form of laboratory reports. (YR).
Prerequisite(s): (PSYC 170 or PSYC 171 or PSYC 101) and PSYC 381

PSYC 470  Advanced Physiological Psych  3 Credit Hours
Further study of the subject matter of PSYC 370. Advanced study of topics in the area of psychobiology. Students cannot receive credit for both PSYC 470 and PSYC 570. (YR).
Prerequisite(s): PSYC 370
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 471  Reproductive Phys and Beh  3 Credit Hours
An in-depth examination of reproduction from a physiological and psychological viewpoint. Physiological topics include anatomy, hormones, and neural mechanisms. Psychological topics include behavior development and descriptions. Students cannot receive credit for both PSYC 471 and PSYC 571. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101

PSYC 473  Clinical Neuropsychology  3 Credit Hours
An in-depth examination of the field of clinical neuropsychology including a review of brain anatomy and physiology, theories of neural organization, and disorders of the nervous system. In addition, students will learn techniques utilized in neuropsychological assessment. (Prerequisite may be waived for students with Natural Science background.) (YR).
Prerequisite(s): PSYC 101

PSYC 474  Animal Learning and Cognition  3 Credit Hours
Animal Intelligence involves the study of human and non-human animal behavior and cognition in an evolutionary and comparative framework. As an introduction to human and non-human animal cognition and though processes this course will examine topics such as problem-solving, spatial cognition, categorization, memory, number concepts, tool-use and tool-production, insight, imitation, social cognition, self-recognition and language(-like) behavior. In addition to discussing basic experimental findings about cognition in animals, an emphasis is placed on the logic and evidence used to justify theoretical conclusions. The course requires reading and critiquing original journal articles in addition to textbook chapters for foundational concepts.
Prerequisite(s): PSYC 372 or PSYC 363 or PSYC 461 or BIOL 419 or BIOL 456 or ANTH 336
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

PSYC 480  History of Psychology  3 Credit Hours
An overview of the development of modern psychology from the 17th century to the present, with particular emphasis on the beginning of psychology in America. The philosophical assumptions of various schools of psychology will be examined. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
PSYC 481  Computers in Psychological Res  3 Credit Hours
An introduction to the use of computers in data analysis and psychological research. Students will receive training in computer programming using SPSS/PC and other software packages. Topics will include: correlation, regression, analysis of variance, and several multivariate techniques. (YR).
Prerequisite(s): PSYC 381

PSYC 485  Psychology Internship  3 or 6 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, geriatrics, human resources/staff development, cognitive impairment, criminal probation, teenage runaways, substance abuse, and women's issues. The program is designed for juniors and seniors with a concentration in psychology or behavioral sciences and involves training in listening and helping skills.
Prerequisite(s): PSYC 171 or PSYC 170 or PSYC 101
Restriction(s):
Can enroll if Class is Junior or Senior

PSYC 488  Primatology Field Course  3 Credit Hours
This Primatology Field course will take students through an exploration of the scientific approach and methodology to the study of animal behavior. Students will gain experience in creating research projects and collecting data on free-ranging animals in a naturalistic environment. Preparation in lectures and activities on the campus of The University of Michigan-Dearborn will include learning about observational methods in detail, practicing developing ethograms and operational definitions, pilot data collection to modify the ethograms at the Detroit or Toledo Zoo, and use of GPS for data collection. Lecture materials will also cover topics of primate behavior and ecology. Students will spend a week observing a primate species (for example, one possible site for this field course may be to observe free-ranging lemurs at a reserve in Florida). Student's data collection at the field site will be for five continuous days. This field course provides a unique opportunity to study rare and endangered primates species in a safe and accessible environment. Short day trips to other facilities are possible, such as a visit to an ape sanctuary. Topics covered in this field course include advanced observational methods stemming from the field of Ethology, practical development of ethograms (checksheets) and research design, best practices in GPS data collection methods, and collating and summarizing data on animal behavior into a research paper. Lecture topics will address ethological methods and research design and also how to conduct research with free-ranging nonhuman primates. In addition there will be a strong focus on health and safety precautions in the field for human and nonhuman primates, acclimation to the field site, and practicalities of data collection. For graduate credit on this course, extra journal articles and longer written papers required than for the undergraduate requirements.
Restriction(s):
Cannot enroll if Class is Freshman

PSYC 490  Advanced Topics in Psychology  3 Credit Hours
Examination of problems and issues in selected areas of psychology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specified topics differ. (OC).

PSYC 492  Individual Research  1 to 3 Credit Hours
No more than 6 hours may be counted for concentration. Arrangements will be made for adequately prepared students to undertake individual research under the direction of a staff member. The students, in electing, should indicate the staff member with whom the work has been arranged. Students cannot receive credit for both PSYC 492 and PSYC 592. (YR).
Restriction(s):
Can enroll if Level is Undergraduate

PSYC 493  Capstone in Psychology  3 Credit Hours
Students completing this capstone course will apply and further develop their skills with research methods, data analysis, critical thinking and writing by completing a research project within the field of psychology. Students will work closely with the faculty member to develop the topic and specific format of the research project. Upon completion of the project, students will reflect upon the skills developed in the program and how they may be useful in the workplace, in graduate or professional school, and in their personal lives. (F, W)
Prerequisite(s): PSYC 381 and PSYC 415 or PSYC 425 or PSYC 435 or PSYC 4445 or PSYC 465
Restriction(s):
Can enroll if Class is Junior or Senior

PSYC 497  Seminar in Psychology  3 Credit Hours
Small seminar examination of problems and issues in selected areas of psychology. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specified topics differ. Written permission of instructor required.

PSYC 497A  Seminar in Psychology  3 Credit Hours
Topic: Seminar in Cognitive Science. Cognitive Science is an interdisciplinary science of mind and intelligence encompassing fields such as cognitive psychology, philosophy, linguistics, neuroscience, and artificial intelligence. The present seminar will investigate cognitive science in terms of the human information processing paradigm of the 1950s and contemporary connectionist challenges to this view.

PSYC 498  Psychology Honors Seminar  3 Credit Hours
Preparation for Honors research project. Involves discussion of and writing on: choosing a topic, reviewing the literature, selecting a research method and design, and developing a research proposal. (YR).

PSYC 499  Psychology Honors Research  3 Credit Hours
Participation with two faculty members in work leading to the honors thesis. This work involves active participation in research and will culminate in an independent research report, the honors thesis. Open only to psychology honors candidates. (F, W).
Prerequisite(s): PSYC 498

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Public Relations
The Certificate in Public Relations (PR) offers students practical training in the contemporary skills of public relations.

For communication majors, it provides an ideal way to complement their broad-based study of communication with the practical skills necessary for entry level work in public relations.

This certificate is also open to all majors across campus, and provides a useful toolkit that will be an excellent complement for any major in liberal arts, business, education, or engineering. The addition of a public relations certificate to these areas highlights the practical skills necessary for a variety of careers in the business, non-profit, or government sector.
By the time students complete the PR certificate they should have met the following program goals:

- Understanding the history and evolution of the public relations field.
- Understanding public relations principles as applicable to a variety of contexts and publics.
- Appreciating the ethical dimensions of public relations practice.
- Writing public relations materials using a variety of traditional and new tools, including social media applications.
- Applying public relations principles in analyzing a variety of situations in multiple cultural contexts.
- Integrating the theory and practice of public relations in multiple contexts.

Certificate Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>COMM 260</td>
<td>Public Relations Principles</td>
<td>3</td>
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<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>COMM 360</td>
<td>Social Media for PR</td>
<td>3</td>
</tr>
<tr>
<td>COMM 460</td>
<td>Public Relations Campaigns</td>
<td>3</td>
</tr>
<tr>
<td>COMM 477</td>
<td>Prof Communication Ethics</td>
<td>3</td>
</tr>
<tr>
<td>JASS 2015</td>
<td>Fundamentals of Journalism</td>
<td>3</td>
</tr>
</tbody>
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Total Credit Hours 18

Notes Regarding PR Certificate Program:

1. A minimum 2.0 cumulative GPA and a minimum of twelve earned hours completed at UM-Dearborn are required for admission to the program.
2. A maximum of nine credit hours may simultaneously count toward the PR Certificate and toward the Communication major.
3. A maximum of two transfer courses (six credit hours) may count toward the PR Certificate.
4. A minimum 2.0 GPA in the courses counting toward the PR Certificate and minimum 2.0 cumulative GPA are required at the time of graduation and/or posting of the certificate.

Religious Studies

Minor or Integrative Studies
Concentration Only

University of Michigan-Dearborn is a part of one of the most ethnically and religiously diverse regions in the nation, with a history of religious centers dating to 1701.

Since the establishment of that first place of worship, Ste. Anne de Detroit Roman Catholic Church, Southeastern Michigan has become home to people of many faiths, including a wide array of Christians, Jews, Muslims, Sikhs, Janis, Buddhists, Bahai’s, and others. It is impossible to understand even our own Western cultural context without some detailed knowledge of the traditions, influence and rational of its religious underpinnings. Thus, the Religious Studies Program at UM-Dearborn has been established to provide a focus for discussions of the ethical standards and the cultural orientations which have been fostered by various religions.
RELS 332  The Reformation Era: 1500-1648  3 Credit Hours
A study of the nature, course, and impact of the Protestant Reformation in Europe, Humanism, the Counter-Reformation, and the cultural and social implications of Protestantism also receive attention. (YR).

RELS 333  Intro to Gospel Music  3 Credit Hours
This course explores the history and aesthetics of Black sacred music within cultural context. Major figures (Thomas A. Dorsey, Mahalia Jackson, The Winans Family, Kirk Franklin), periods (slavery, Great Migration, Civil Rights movement), and styles (folk and arranged Negro spirituals, congregational songs, and gospel songs - traditional to contemporary) will be studied through recording, videos, film, and at least one field experience. Underlying the course is the theory (Mellonee Burnim and Pearl Williams-Jones) that gospel music is an expression of African American culture that fuses both African and European elements into a unique whole. (OC).

RELS 335  Women in Medieval Art  3 Credit Hours
Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women’s roles in the creation and patronage of art and literature, economic and family issues, and women’s participation in new and innovative forms of religious piety.

RELS 337  Islamic Movements in the Middle East 3 Credit Hours
Will compare several Islamic movements in Middle Eastern history, starting with the rise of Islam in Mecca and Medina. Later impulses toward Islamic revival all looked back to the first movement, and hoped to capture both its spirit and its success. With this as background, the course will move to address two questions: How did later Islamic movements understand the history of the rise of Islam? How have later Islamic movements had to adapt their methods and their ideology to different historical circumstances? (AY).

RELS 338  Women & Islam in the Middle East to 1900  3 Credit Hours
This course covers the historical development of Islam’s normative stance towards women and gender roles in the Middle East from the rise of Islam to the earliest stirrings of feminist activism.

RELS 341  Religion and Literature  3 Credit Hours
An investigation of the ways in which religious ideas and practices have informed works of literature, and vice versa. Surveying a variety of genres and themes, the course will focus mainly on British and/or American literature and its engagement with Judaeo-Christian religion, though some attention may be devoted to other literary and religious traditions (e.g., ancient and medieval texts, European and world literature, Islam and Eastern religions).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

RELS 346  Bible and Western Tradition  3 Credit Hours
A detailed study of major episodes from the Bible, first as a literary work, and second as it is reflected in both poetry and the visual arts during the Renaissance and Baroque periods. Included are selected works by such masters as John Donne, George Herbert, and John Milton in poetry and Michelangelo, Raphael, and Leonardo da Vinci in painting and sculpture.

RELS 349  Bible in/As Literature 3 Credit Hours
This course will study selected readings from the Bible, first in regard to their own literary, historical, and cultural contents, and then in regard to their reception, interpretation, and reapplication by later literary tradition. Biblical selections will cover both the Old and New Testaments as well as Apocryphal traditions, while reading from later non-biblical texts will be drawn from various literary periods.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)

RELS 355  Religion and Politics  3 Credit Hours
The primary focus of the course is on political movements or systems that take a religious form or have a religious base or use a religiously-rooted ideology. Possible themes or cases covered include the Catholic Church as a political system, Evangelical politics in America, religious uprisings, and Islamic political movements. (AY)

RELS 360  Myth, Magic, and Mind  3 Credit Hours
A broadly based introduction to the range of human mythical and magical traditions. Sophomore standing; ANTH 101 highly recommended. (YR).

RELS 363  Rel in Amer Hist: 1607-1865  3 Credit Hours
A survey of the religious movements and trends in America from the 17th century to the Civil War, with emphasis on Puritanism, 18th-century revivalism, and 19th-century denominationalism and social reform. (AY).

RELS 364  Rel in Am Hist II: 1865-Present  3 Credit Hours
A survey of American religion from the Civil War to the present, with emphasis on ethnicity and religion and post-World War II revivals of religion. (AY).

RELS 365  Introduction to the Qur’an  3 Credit Hours
This course is an introduction to the Qur’an. This class will cover the historical and the cultural factors in which the Qur’an appeared. The class will also examine some of the major themes covered in the Qur’an such as gender, science, pluralism, worldview and so forth. Also, will cover major schools of interpretations and methodologies ranging from the literary to the scientific. The class will be conducted in English and knowledge of Arabic is desired but not required. No prerequisites. The class will consist of lectures, discussions, and movies.

RELS 367  Religion and Resistance  3 Credit Hours
This course examines how religion and spirituality as cultural form has been instrumental in influencing social, political, and economic thought and the action of violent and nonviolent resistance. In such, African Americans have affirmed their humanity, their citizenship, and have exerted mechanisms of protest and change that have in-kind influenced similar thought and activity around the globe. When contemporary students are aware of this history at all, it is often without the knowledge or understanding of the various forms of resistance and the range of reason and spirituality behind this activity. The course will present key figures from within this range (AY).
**RELS 373  Bible in History  3 Credit Hours**
In this course we will try to examine the historical circumstances and contexts surrounding the writing of The Hebrew Bible. Roughly speaking, we will begin by exploring three aspects of the subject: Historical context of the writing of the Bible—i.e. during the organizing and communicating of each segment. History of the canonization: the ideas and rationale behind including some books but not others. History in the Bible. In more specific terms, this will entail examining who wrote the Bible, when and why. The narrative incorporates the movement from an oral tradition to a written one and will demand some focus on certain pivotal moments, e.g., Ezra's reading (cf. Ezra-Nehemiah), or the historical events in Kings and Chronicles, or the defeat of the northern kingdom of Israel in 722 B.C.E. (BC) and of the southern kingdom of Judah in 589 B.C.E.

**RELS 384  Islamic Decorative Arts  3 Credit Hours**
This course is an in-depth investigation of the decorative arts of the Islamic Middle East from the seventh through the eighteenth century including the lands of Islamic Spain and North Africa and extending east to Afghanistan. The course traces the development of decorative styles in objects of daily and courtly life, particularly ceramics, metal work, glass, wood and ivory carving, textiles and rugs. The central role played by calligraphy in all of the arts is emphasized as well as in manuscript production and the Arts of the Book. As a religion, but also a way of life, Islam fostered a distinctive artistic production reflected in these decorative arts.

**Prerequisite(s):** ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106 or HUM 201 or RELS 201

**RELS 385  Philosophy of Religion  3 Credit Hours**
A philosophical examination of basic religious problems, such as the nature and grounds of religious belief, the existence and nature of God, human immortality, the relations of religion and science, and the nature or religious language. Students electing this course must have successfully completed a previous course in philosophy or have permission of the instructor.

**Prerequisite(s):** PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 365 or PHIL 340 or PHIL 355 or PHIL 350 or PHIL 369 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 442 or PHIL 445 or PHIL 485 or PHIL 490 or RELS 120

**RELS 390  Topics in Religious Studies  3 Credit Hours**
Examination of problems and issues in selected areas of religious studies. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. Junior standing required.

**Restriction(s):**
Cannot enroll if Class is Freshman or Sophomore

**RELS 393  Black Women, Rel & Spirituality  3 Credit Hours**
This lecture course surveys descriptive and critical literature relevant to the religious and spiritual experience and thought of African diasporic women. Studying religiosity and spirituality among this population helps students understand this influential, culturally-constructed world view of Black women as they engage in a variety of institutions including healthcare, economic activity, the criminal justice system, politics, and social relationships. The course gives particular attention to Black feminist and Womanist literature on these topics. (AY)

**Restriction(s):**
Cannot enroll if Class is Freshman

**RELS 401  Religion in Contemp US Culture  3 Credit Hours**
The purpose of this course is to provide people in contemporary multi-religious America foundational information about beliefs and practices of several of the world’s religions sufficient to engage in inter-religious dialogue. Special emphasis will be given to changes the American religious landscape after 1965 with the passage of new immigration laws. The course will combine lectures and visits to a variety of Metropolitan Detroit religious centers including Hindu, Buddhist, Jain, Sikh, Jewish, Christian, Muslim, and Native American. (S).

**RELS 404  Medieval Mystical Writers  3 Credit Hours**
A study of the genre of mystical writing as it was developed and practiced throughout the Middle Ages and in 14th century England particularly. Attention will be given to the historical, religious, and cultural contexts that enabled and were created by mystical texts. In addition, the course will explore how traditional and contemporary trends in the fields of religious and literary studies can be brought to bear on the genre of mystical writing. (OC)

**Prerequisite(s):** (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)

**RELS 440  Religion and Culture  3 Credit Hours**
An introduction to the comparative study of religious systems. Explores religious beliefs and practices in non-Western cultures; surveys theoretical approaches to the study of religion; and discusses how religions grow, develop, and change. ANTH 101 recommended. (YR).

**RELS 455  Sociology of Religion  3 Credit Hours**
Religion as a social institution; its purposes, methods, structure, and beliefs, and its relation to other institutions.

**Prerequisite(s):** SOC 200 or SOC 201

**RELS 498  Independent Study  3 Credit Hours**
This course provides an opportunity for qualified students interested in Religious Studies to pursue independent research under the direction of a qualified faculty member. The project must be defined in advance, in writing, and must be a topic not currently offered in the regular curriculum.

**Prerequisite(s):** HUM 201 or PHIL 120

**Restriction(s):**
Can enroll if Class is Junior or Senior

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Science and Technology Studies**

**Minor or Integrative Studies**

**Concentration Only**

Science and Technology Studies (STS) is a multidisciplinary field.

It uses the perspectives and approaches of the humanities and social sciences to examine the social contexts in which science and technology are produced, and the social consequences and cultural reactions to
them. The STS Program gives special attention to the impact of the automobile and automobile industry on American culture.

The STS Program at UM-Dearborn was launched in 2002 by a group of interdisciplinary faculty from the College of Arts, Sciences, and Letters and the College of Engineering and Computer Science. It is the first in the nation to provide a special focus on a particular technology and particular industry—the automobile—with national and global impact. The STS Program is thus designed to bring together students and faculty who want to understand the societal dimensions of science and technology, whether they are studying science, engineering, the humanities, social or behavioral sciences, or business.

STS is an ideal complement for almost any major, whether in physics or philosophy, engineering or economics, management or math, communications or chemistry. In a world that's increasingly shaped by science and technology, and in a region where many jobs are still connected to an automobile industry undergoing its most profound changes in over a century, STS provides new ways of understanding the scientific and technological issues facing us in our lives and our careers.

The STS minor/concentration consists of an introductory course, STS 300 (Introduction to Science and Technology Studies), and at least one course from each of three groups of upper-level course offerings on "Science, Technology, and Cultures," "Science, Technology, and Labor," and "Science, Technology, and Environments." Many of the Program's courses, including the introductory one, contain at least some focus on the automobile, but students are also able to study a variety of other topics, from environmental ethics to the legal and political issues raised by the internet to women and science.

### Minor or Integrative Studies

#### Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS 300</td>
<td>Intro to Sci &amp; Technol Studies</td>
<td>3</td>
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</table>

#### Science, Technology and Cultures (CABT)

Select one course from the following: 3 Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>STS/SOC 310</td>
<td>Digital Media and Society</td>
</tr>
<tr>
<td>STS 326/</td>
<td>Gender, Science &amp; Engineering</td>
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<tr>
<td>NSCI 325/</td>
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<tr>
<td>WGST 325</td>
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<tr>
<td>STS/ANTH</td>
<td>Race and Evolution</td>
</tr>
<tr>
<td>340</td>
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<tr>
<td>STS/ANTH</td>
<td>Cultural Ecology &amp; Evolution</td>
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<tr>
<td>345</td>
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<tr>
<td>STS/HIST</td>
<td>Thomas Edison and His Era</td>
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<tr>
<td>349</td>
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<tr>
<td>STS/PHIL</td>
<td>Philosophy of Technology</td>
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<tr>
<td>360</td>
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</tr>
<tr>
<td>STS/HIST</td>
<td>Hist of Industrial Technology ¹</td>
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<tr>
<td>374</td>
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<tr>
<td>STS/HIST</td>
<td>Comparative Hist of Technology ¹</td>
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<tr>
<td>386</td>
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<tr>
<td>STS/JASS</td>
<td>Issues in Cyberspace</td>
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<tr>
<td>403</td>
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<tr>
<td>STS/ANTH</td>
<td>Human Body, Growth &amp; Health</td>
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<td>409</td>
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<td>STS 410/</td>
<td>Darwinism and Philosophy</td>
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<td>PHIL 310</td>
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<tr>
<td>STS/ANTH</td>
<td>Medical Anthropology</td>
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<tr>
<td>STS/PHIL</td>
<td>Philosophy of Science</td>
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Select one additional course from any of the above: 3 Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>STS/ENGL/</td>
<td>Env Lit &amp; Reps of Nature</td>
</tr>
<tr>
<td>ENST 488</td>
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#### Science, Technology and Labor (CABY)

Select one course from the following: 3 Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>STS 305</td>
<td>Social Issues in Auto Design ¹</td>
</tr>
<tr>
<td>STS/SOC 310</td>
<td>Digital Media and Society</td>
</tr>
<tr>
<td>STS/ECON</td>
<td>Labor in the American Economy ¹</td>
</tr>
<tr>
<td>321</td>
<td></td>
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<tr>
<td>STS/HIST</td>
<td>Labor in America ¹</td>
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<tr>
<td>383</td>
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<tr>
<td>STS/SOC 442</td>
<td>Sociology of Work ¹</td>
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<tr>
<td>STS/PSYC 464</td>
<td>Applied Cognitive Psychology</td>
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</table>

#### Science, Technology and Environments (CABE)

Select one course from the following: 3 Hours

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>STS/ENST 301</td>
<td>Concepts of Environmentalism ¹</td>
</tr>
<tr>
<td>STS 305</td>
<td>Social Issues in Auto Design ¹</td>
</tr>
<tr>
<td>STS 308/</td>
<td>Urban Geography</td>
</tr>
<tr>
<td>ENST 300/</td>
<td></td>
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<tr>
<td>GEOG 300</td>
<td></td>
</tr>
<tr>
<td>STS 309/</td>
<td>Economic Geography ¹</td>
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<td>ENST 310/</td>
<td></td>
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<tr>
<td>GEOG 310</td>
<td></td>
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<tr>
<td>STS/ENST/</td>
<td>Environmental Ethics</td>
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<tr>
<td>PHIL 312</td>
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<tr>
<td>STS/ENST/</td>
<td>Environmental Politics ¹</td>
</tr>
<tr>
<td>POL 325</td>
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<tr>
<td>STS/ENST 365</td>
<td>Environmental Psychology ¹</td>
</tr>
<tr>
<td>STS/HIST</td>
<td>Henry Ford and His Place</td>
</tr>
<tr>
<td>3666</td>
<td></td>
</tr>
<tr>
<td>STS/HIST</td>
<td>The American City ¹</td>
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<tr>
<td>3695</td>
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</tbody>
</table>

Select one additional course from any of the above: 3 Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
</table>

Total Credit Hours: 15

¹ A course that contains some attention to the automobile.

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**STS 300 Intro to Sci & Technol Studies** 3 Credit Hours

An examination of the social contexts and consequences of science and technology, with special attention to the impacts of the automobile and automobile industry on American society. Topics include the automobile's role in the history of manufacturing; the impact of various production techniques on work and workers; the effects of the automobile on the natural environment, the design of cities and development of suburbs, and ways of life; the iconic status of the car in American culture and the relationship between automobile design and aesthetics. (YR).

**STS 301 Concepts of Environmentalism** 3 Credit Hours

Designed to identify the underlying concepts of any environmental issue. The course will demonstrate the interdisciplinary nature of environmental problem-solving through current readings, classical monographs, and films. Students will conduct a systems analysis of a household and a local community. A major research paper on an environmental topic will be required. The course will not be open to students who take ENST 105. (YR).
STS 305  Social Issues in Auto Design  3 Credit Hours
An examination of the impact of four contemporary social issues - vehicle safety, energy consumption, environmental impact, and a changing workforce - on the design and engineering of automobiles in the context of globalization and rapid technological change. Using a series of case studies, the course will focus on the ways social concerns, government regulation, and professional ethics, as well as industry standards and technical considerations, affect the decision-making processes of automobile designers and engineers. (OC).
Prerequisite(s): COMP 105 or COMP 110 or Composition Placement Score with a score of 30

STS 308  Urban Geography  3 Credit Hours
The geography of human settlement and urbanization. Particular emphasis is placed on human transformation of the physical environment, and resource use throughout history from ancient civilizations to modern megalopolises. Universal urban challenges, such as sprawl, pollution, congestion, crime, poverty, etc., are addressed. (F,W).

STS 309  Economic Geography  3 Credit Hours
Spatial aspects of the ways people make their living. Discussion of the spatial distribution of resources and wealth at various scales. Introduction of site selection and location analysis. (F).

STS 310  Computers and Society  3 Credit Hours
A sociological discussion of computers and other information technology starting with the larger concept of technology and social change, an exploration of various forms of information technology, their history and development, their relationship to the changing social structure of a post-industrial society like 20th/21st-century USA. Case studies could include "Computers and the Workplace," "Computers in Medicine," "Computers and Education," and "Computers in Popular Culture." Course concludes with a discussion of new social problems and possible futures. (OC).
Prerequisite(s): SOC 200 or SOC 201

STS 312  Environmental Ethics  3 Credit Hours
The relationship of human beings to the non-human environment raises pressing moral and political issues. This course will use the theories and concepts of philosophical ethics to explore such questions as human obligations to non-human animals; the preservation of wilderness; balancing economic, aesthetic, and spiritual values; and the problems of pollution, urban sprawl, and ecological justice. (OC).
Prerequisite(s): PHIL 100 or PHIL 233 or CRJ 240 or ENST 105 or ENST 301

STS 321  Labor in the American Economy  3 Credit Hours
An analysis of the nature and underlying causes of the problems facing the worker in modern economic society. Includes an examination of wages, unemployment, economic insecurity, the trade union movement, collective bargaining, and labor legislation. (F).
Prerequisite(s): ECON 201 and ECON 202

STS 325  Environmental Politics  3 Credit Hours
An examination of policy making about problems affecting the environment, at a global, national, and local scale.

STS 326  Gender, Science & Engineering  3 Credit Hours
Explores some of the history of women in science and engineering, the current status of women in science and engineering, and feminist theory in research. Topics include cultural influences on women in science and engineering, careers and life balance, and a Feminist approach to scientific and engineering teaching and research.

STS 340  Race and Evolution  3 Credit Hours
An evolutionary survey of the biological differences among human populations in response to such factors as climate, culture, disease, nutrition, and urbanization. The meaning of racial variation is discussed in terms of adaptation to environmental stress. "Race" is rejected; racism is discussed. (AY).

STS 345  Cultural Ecology & Evolution  3 Credit Hours
An introduction to the study of human ecology. This course employs the case-study method to develop an evolutionary and biocultural perspective on the relationship between human beings and their environments. (OC).

STS 349  Thomas Edison and His Era  3 Credit Hours
This course will introduce students to the life and work of Thomas Edison. Breaking with the stereotype of the lone inventor/genius, we will examine how Edison helped shape and was in turn shaped by the context of the Gilded Age America when the United States emerged as an urban, industrial nation. Lectures and discussions will be supplemented by slides, films, and visits to the Edison-related sites at the Henry Ford. Throughout the course the following themes will be explored: invention and the labor process, the significance of manufacturing and marketing, the origins of modern consumer culture. (OC).

STS 360  Philosophy of Technology  3 Credit Hours
A study of both the history of, and current issues in, the philosophy of technology. This course will examine the deeper meaning and implications of our modern technological society. Questions examined include: What is the definition and nature of technology? How did the concept originate in Western thought? What is the relationship between modern industrial technology and the 'mechanistic' worldview? How do Western religious beliefs influence our attitudes about technology? Is technological progress socially determined, or is it culturally independent? In what ways has our technological society been supportive of, or detrimental to, overall human well-being? Students will cover both classic and contemporary readings.

STS 365  Environmental Psychology  3 Credit Hours
A survey of the contributions of the behavioral sciences to the understanding and solution of environmental problems that threaten our survival. Insights derived from psychology, anthropology, and computer science are discussed. Major topics include overpopulation, overconsumption of resources and energy, future shock, cognitive limitations in our understanding of ecological-political systems, and the use of behavioral control. (OC).
Prerequisite(s): PSYC 170 or PSYC 171

STS 366  Henry Ford and His Place  3 Credit Hours
Using the biography of Henry Ford as a touchstone, the course will examine the trajectories of historical change and regional development between 1870 and 1950. Of fundamental concern will be southeastern Michigan's transformation from a 19th century outpost on the Great Lakes to the nation's "engine of change" in the 20th century. Henry Ford was the major player in that revolutionary transformation. This course examines his role in history and mythology as well as the causes and implications of that transformation. (OC).
**STS 374  Hist of Industrial Technology  3 Credit Hours**
Focusing on western Europe and the United States since the Industrial Revolution, this course will examine the history of manufacturing technologies and will include the following topics: mechanization and the rise of the factory; mass production; the process of innovation; design and diffusion of new technologies; technologies; technology and the changing nature of work; discussions, and examination of artifacts (actual tools and machines), students will consider the central role played by technology in the making of modern society. (YR).

**STS 383  Labor in America  3 Credit Hours**
A survey of urban workers from colonial times to the present. Among the topics covered are changing standards of living, the experiences of industrial work, labor organizations, and working-class politics. (OC).

**STS 386  Comparative Hist of Technology  3 Credit Hours**
This course will examine the history of technology from a comparative perspective; studying the development and impact of technology in different societies during various historical eras. Topics include: irrigation control and the rise of ancient empires; technology’s role in the industrial revolution; technological innovation and the pace of social change. Current issues and various analytical perspectives in the history of technology will also be examined. (OC).

**STS 390  Topics in STS  3 Credit Hours**
Examination of problems and issues in selected areas of Science and Technology Studies. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topics differ. (OC).

**STS 401  Economics of the Labor Sector  3 Credit Hours**
Theoretical analysis and empirical studies of the nature and operation of labor markets. Includes theories of wage determination and income distribution, the nature of unemployment, the impact of collective bargaining on the economy, the extent and economic effects of discrimination, and the nature and effects of government wage and employment policies. ECON 321/STS 321, Labor in the American Economy, is valuable background to this course although it is not a prerequisite. This course counts as a required capstone (4000-level) course in Economics and also counts toward the Economics Honors designation.

**Prerequisite(s):** ECON 302

**STS 403  Issues in Cyberspace  3 Credit Hours**
This course will explore some of the social, political, legal, and technological issues associated with the use of new media technology to move ideas and information in a democratic society. Examples of areas to be explored include the Internet and World Wide Web, privacy, the future of the mass audience, and the meaning of the First Amendment in the 21st Century. (AY).

**Prerequisite(s):** COMM 280

**STS 409  Human Body, Growth & Health  3 Credit Hours**
This course provides and advanced undergraduate introduction to the topic of human growth and shows how human growth can be a reliable measure of the psychological, social, economic and moral conditions of a society. A major theme will be the interplay of biology and culture in shaping the patterns of human growth and, consequently, the health of populations and individuals. (OC).

**STS 410  Darwinism and Philosophy  3 Credit Hours**
Darwinism represents a challenge to the traditional view of human life as radically separate from the rest of the natural world. This course will examine the philosophical implications of this world view. It will address questions such as these: Is Darwinism compatible with traditional religion? Does Darwinism imply that human life and the cosmos are without purpose? Can human life be meaningful if it is the result of evolution and natural selection? Does Darwinism require us to change our view of nature? What are the ethical implications of a Darwinian view of life and the universe? (OC).

**Prerequisite(s):** PHIL 100 or PHIL 210 or PHIL 200 or PHIL 233 or PHIL 240

**Restriction(s):** Cannot enroll if Class is

**STS 430  Medical Anthropology  3 Credit Hours**
A comprehensive examination of how culture mediates processes of illnesses and healing. Comparative materials examined, which provide a context for an anthropological analysis of modern biomedicine. (YR).

**STS 442  Sociology of Work  3 Credit Hours**
The study of work roles in modern society. The impact of industrialization, professionalization, and unionization on the conditions of work, worker motivation, and job satisfaction. Career choice processes and career patterns, occupational status and prestige, and occupations associations are among the topics to be considered. (YR).

**Prerequisite(s):** SOC 200 or SOC 201

**STS 464  Applied Cognitive Psychology  3 Credit Hours**
The focus will be on the application of the principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language.

**Prerequisite(s):** PSYC 170 or PSYC 171

**STS 485  Philosophy of Science  3 Credit Hours**
A critical study of the foundations of the sciences, natural and social, with emphasis on the following topics: the nature of scientific method, theories and explanation, probability and determinism, the unity of the sciences. (OC).

**Prerequisite(s):** PHIL 100 or PHIL 120 or PHIL 200 or PHIL 233 or PHIL 240

**STS 488  Env Lit & Reps of Nature  3 Credit Hours**
An interdisciplinary study of the ways in which the relationship between “nature” and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th and 20th centuries, but assigned materials may include readings from other cultures and historical periods. (OC).

**Prerequisite(s):** (COMP 106 or COMP 220 or COMP 280 or Composition Placement Score with a score of 40 or COMP 270) and (ENGL 230 or ENGL 231)

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally.
Social Science Research Methodology

This minor/concentration focuses on social science research methods and statistical analysis. It is open to students from all majors and would benefit students who wish to develop skills directly applicable to specific fields or majors including business, consumer research, economics, education, and information technology.

Minor or Integrative Studies
Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
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<tr>
<td>ANTH 370</td>
<td>Indians of North America</td>
<td></td>
</tr>
<tr>
<td>ECON 305</td>
<td>Economic Statistics</td>
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<tr>
<td>ECON 4015</td>
<td>Introduction to Econometrics</td>
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<tr>
<td>POL 300</td>
<td>Political Analysis</td>
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<tr>
<td>PSYC 381</td>
<td>Prin of Stat and Exper Design</td>
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<tr>
<td>PSYC/STS 464</td>
<td>Applied Cognitive Psychology</td>
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<td>SOC/CRI/HHS</td>
<td>Quantitative Research</td>
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<td>SOC 413</td>
<td>Qualitative Research</td>
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Social Studies

The Bachelor of Arts in Social Studies provides students with a broad range of courses through which to examine and appreciate the processes and institutions that shape civilizations and social orders. It seeks to recreate the context of changing human activities, be they cultural, economic, geographic, political, or social, and to explain and understand the contemporary human condition. Because of its interdisciplinary structure, the Social Studies major is valuable for those who want a multidimensional understanding of the human past and future, and of the contemporary world and their own place in it.

The degree was especially designed for students seeking to become secondary school teachers, but it could also provide background for those who seek a career in government work, law or business.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

Ancient Greek I and II MCL 105 and MCL 106
Arabic I and II ARBC 101 and ARBC 102
Armenian I and II MCL 111 and MCL 112
Chinese I and II CHIN 101 and CHIN 102
French I and II FREN 101 and FREN 102
German I and II GER 101 and GER 102
Latin I and II LAT 101 and LAT 102
Spanish I and II SPAN 101 and SPAN 102

Pre-Major Requirements

The Social Studies major requires the student to take two introductory courses.

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credit Hours</th>
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<tr>
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<td></td>
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</tr>
<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
<td></td>
</tr>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td></td>
</tr>
<tr>
<td>HIST 111</td>
<td>The American Past I</td>
<td></td>
</tr>
</tbody>
</table>
## Major Requirements

Students must complete 33 credit hours of coursework in Economics, Geography, History, and Political Science from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geography</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One course any GEOG 100-400 level</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>One course any GEOG 300/400; 3000/4000 level</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Economics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td></td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>ECON 2001</td>
<td>Introductory Economics</td>
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<tr>
<td>Any ECON 300/400; 3000/4000 level</td>
<td>3</td>
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<tr>
<td><strong>U.S. History (CAUS)</strong></td>
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<tr>
<td>Select one course from the following:</td>
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</tr>
<tr>
<td>HIST/AAAS/ HUM/SOC 304</td>
<td>Studies in Det. Hist &amp; Culture</td>
<td></td>
</tr>
<tr>
<td>HIST/ARTH/ HUM 305</td>
<td>The Arts &amp; Culture of Detroit</td>
<td></td>
</tr>
<tr>
<td>HIST/AAAS 316</td>
<td>African American History</td>
<td></td>
</tr>
<tr>
<td>HIST 318</td>
<td>Early American Republic</td>
<td></td>
</tr>
<tr>
<td>HIST 319</td>
<td>Civil War &amp; Reconstruction</td>
<td></td>
</tr>
<tr>
<td>HIST/STS 349</td>
<td>Thomas Edison and his Era</td>
<td></td>
</tr>
<tr>
<td>HIST 354</td>
<td>The United States and Vietnam</td>
<td></td>
</tr>
<tr>
<td>HIST 355</td>
<td>Eng Colonies in Amer,1607-1763</td>
<td></td>
</tr>
<tr>
<td>HIST 356</td>
<td>American Revolution, 1763-1815</td>
<td></td>
</tr>
<tr>
<td>HIST 358</td>
<td>Emerg of Modern U.S.,1876-1916</td>
<td></td>
</tr>
<tr>
<td>HIST 359</td>
<td>Era of World Wars:1916-1946</td>
<td></td>
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<tr>
<td>HIST 360</td>
<td>The U.S. Since 1946</td>
<td></td>
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<tr>
<td>HIST 3601</td>
<td>Michigan History</td>
<td></td>
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<tr>
<td>HIST 3602/ AMST 300/ COMM 306/ ENGL/SOC 306</td>
<td>Comparat. American Identities</td>
<td></td>
</tr>
<tr>
<td>HIST/ECON 361</td>
<td>United States Economic History</td>
<td></td>
</tr>
<tr>
<td>HIST/RELS 363</td>
<td>Rel in Amer Hist:1607-1865</td>
<td></td>
</tr>
<tr>
<td>HIST 3622</td>
<td>The US in the Middle East</td>
<td></td>
</tr>
<tr>
<td>HIST/AAAS/ AAST/RELS 3634</td>
<td>History of Islam in the US</td>
<td></td>
</tr>
<tr>
<td>HIST 3635</td>
<td>The 1960s in America</td>
<td></td>
</tr>
<tr>
<td>HIST/RELS 364</td>
<td>Rel in Am Hist II:1865-Present</td>
<td></td>
</tr>
<tr>
<td>HIST/AAAS 3640</td>
<td>Black Intellectual History</td>
<td></td>
</tr>
<tr>
<td>HIST/AAAS 3651</td>
<td>Women Leadership/Social Change</td>
<td></td>
</tr>
<tr>
<td>HIST 3665</td>
<td>Automobile in American Life</td>
<td></td>
</tr>
<tr>
<td>HIST/STS 3666</td>
<td>Henry Ford and His Place</td>
<td></td>
</tr>
<tr>
<td>HIST 3671/ AAST 3150</td>
<td>Intro to Arab American Studies</td>
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<tr>
<td>HIST 3672/ AAST 3151</td>
<td>Public Cultural Work</td>
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<tr>
<td>HIST/AAST 3673</td>
<td>Arabs &amp; Muslims in Media</td>
<td></td>
</tr>
<tr>
<td>HIST/AAST 3676</td>
<td>Arab Americans Since 1890</td>
<td></td>
</tr>
<tr>
<td>HIST 3678</td>
<td>Black Exp in US: 1865-Present</td>
<td></td>
</tr>
<tr>
<td>HIST/AAS 369</td>
<td>Civil Rights Movement in Amer</td>
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</tr>
<tr>
<td>HIST 3695</td>
<td>American City</td>
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</tr>
<tr>
<td>HIST/STWST 370</td>
<td>Women in Am-Hist Perspective</td>
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<tr>
<td>HIST 371</td>
<td>American Ideas, 1607-1865</td>
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<tr>
<td>HIST/STS 374</td>
<td>History of Industrial Technlg</td>
<td></td>
</tr>
<tr>
<td>HIST 3750</td>
<td>Modern Warfare</td>
<td></td>
</tr>
<tr>
<td>HIST/STS 383</td>
<td>Labor in America</td>
<td></td>
</tr>
<tr>
<td>HIST 384</td>
<td>Immigration in America</td>
<td></td>
</tr>
<tr>
<td>HIST/STWST 386</td>
<td>Compar History of Technology</td>
<td></td>
</tr>
<tr>
<td>HIST 465</td>
<td>The Family in History</td>
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</tr>
<tr>
<td>HIST 4600</td>
<td>U.S. Cultural History</td>
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</tr>
<tr>
<td>HIST/STWST 4650</td>
<td>Sem in US Women's History</td>
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</tr>
<tr>
<td>HIST/AAST 4677</td>
<td>Arab American Identities</td>
<td></td>
</tr>
<tr>
<td>HIST 4690</td>
<td>Borderlands History</td>
<td></td>
</tr>
<tr>
<td><strong>Non-U.S History</strong></td>
<td></td>
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<tr>
<td>Three courses HIST 300/400; 3000/4000 level - MUST be in 3 different global areas:</td>
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<tr>
<td>Africa (CASF):</td>
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<tr>
<td>HIST 336</td>
<td>The Contmp World, 1945-Present</td>
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<tr>
<td>HIST/AAAS 345</td>
<td>West Africa Since 1800</td>
<td></td>
</tr>
<tr>
<td>HIST/AAAS 4401</td>
<td>Seminar: African Diaspora</td>
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<tr>
<td>Asia (CASA):</td>
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</tr>
<tr>
<td>HIST 307</td>
<td>Early Russian History</td>
<td></td>
</tr>
<tr>
<td>HIST 308</td>
<td>Imperial Russia</td>
<td></td>
</tr>
<tr>
<td>HIST 309</td>
<td>The Russian Revolutions</td>
<td></td>
</tr>
<tr>
<td>HIST 321</td>
<td>Late Imperial China</td>
<td></td>
</tr>
<tr>
<td>HIST 322</td>
<td>Traditional China</td>
<td></td>
</tr>
<tr>
<td>HIST 323</td>
<td>History of Modern China</td>
<td></td>
</tr>
<tr>
<td>HIST 325</td>
<td>Traditional Japan</td>
<td></td>
</tr>
<tr>
<td>HIST 326</td>
<td>Modern Japan</td>
<td></td>
</tr>
<tr>
<td>HIST 336</td>
<td>The Contmp World, 1945-Present</td>
<td></td>
</tr>
<tr>
<td>HIST 354</td>
<td>The United States and Vietnam</td>
<td></td>
</tr>
</tbody>
</table>
HIST/STS 386  Compar History of Technology
HIST 4690  Borderlands History
Europe (CASE):
  HIST 302  Russian Intellectual History
  HIST 306  20th-C Russian Intel History
  HIST 307  Early Russian History
  HIST 308  Imperial Russia
  HIST 309  The Russian Revolutions
  HIST 3121  Polish History Since 1800
  HIST 3122  Poland - Study Abroad
  HIST 3130  Armenia Ancient Medieval World
  HIST 3131  Armenia in the Soviet Period
  HIST 3132  Armenians in the Modern World
  HIST 314  England: Tudors and Stuarts
  HIST 315  Modern Britain
  HIST 329  Medieval Society
  HIST 330  The Renaissance
  HIST 331/RELS 332  The Reformation Era: 1500-1648
  HIST 333  The Age of Revolution in Europe and the World
  HIST 334  Europe in Age of Imp:1815-1914
  HIST 335  20th-Century Europe, 1890-1945
  HIST 336  The Contmp World, 1945-Present
  HIST 3368  Germany Since 1945
  HIST 3380  The European City, 1750-2000
  HIST 3390  20th c European Women’s Hist
  HIST 340  Freud’s Vienna: 1866-1920
  HIST 343  Germany Before Hitler
  HIST/ECON 362  Eur and Intern’l Econ History
  HIST/STS 374  History of Industrial Technlg
  HIST 378  History of Consciousness
  HIST 379  Language, Myth & Dreams
  HIST 381  Intell Hist of Modern Europe
  HIST 385  Modern France
  HIST/STS 386  Compar History of Technology
  HIST 387  Aspects of the Holocaust
  HIST/HUM 389  Nazi Germany
  HIST 4312  European Encounters, 1400-1800
Middle East (CASM):
  HIST 303  The Birth of Civilization
  HIST 3130  Armenia Ancient Medieval World
  HIST 3131  Armenia in the Soviet Period
  HIST 3132  Armenians in the Modern World
  HIST 336  The Contmp World, 1945-Present
  HIST/RELS 337  Islamic Movemnts Mid East Hist
  HIST/RELS/WGST 338  Women&Islam Mid East to 1900
  HIST 339  Ottoman Empire in 19th Century
  HIST 341  Hist, Lit, & 20th Century Iran
  HIST 3502  The Middle East 570 to 1800 CE
  HIST 3511  Modern Middle East, 1918-1945
  HIST 3512  Modern Middle East, 1945-1991
  HIST 3520  Lebanon in Modern Middle East
  HIST 3632  The US in the Middle East
  HIST/AAST 3676  Arab Americans Since 1890
  HIST 3730/RELS 373  Bible in History
  HIST/WGST 4505  Feminism & Mod. Mid. East
  HIST 4515  Culture& Hist. in Mod. Iran
  HIST/AAST 4677  Arab American Identities
  HIST/AAST 4678  Middle Eastern Diasporas
Political Science
  Two courses any POL 300/400; 3000/4000 level  6
Additional Economics, Geography, or Political Science
  One course any ECON, GEOG, or POL 300/400; 3000/4000 level  3
Cognates
  Students must also complete six credit hours in upper level cognate courses from any CASL discipline (excluding ECON, GEOG, HIST, POL, MATH 385, MATH 386, MATH 387); or Education courses (EDA and EDC only).

Total Credit Hours  39

For Secondary Education Certification Students
Please see the College of Education, Health, and Human Services secondary certification (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/undergraduate-degree-programs/secondary-grades-6-12-certification/) section for specific courses required.

Notes:
1. At least 15 of the 27 upper level credit hours required for the major must be elected at UM-Dearborn.

Society and Technological Change
An interdisciplinary approach to the questions of technology and society is required in order to keep pace with rapid technological change and an increasingly complex digital future. This area of study also develops analytical abilities, verbal and written communications skills, and critical thinking.

Minor or Integrative Studies Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 453</td>
<td>Contemporary American Novel</td>
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</tr>
<tr>
<td>JASS/STS 403</td>
<td>Issues in Cyberspace</td>
<td></td>
</tr>
<tr>
<td>LIBS 364</td>
<td>The European Union</td>
<td></td>
</tr>
<tr>
<td>PSYC/STS 464</td>
<td>Applied Cognitive Psychology</td>
<td></td>
</tr>
</tbody>
</table>
**Sociology**

Sociology is the study of society and how it is shaped by individual and collective action.

A "sociological imagination" helps us to see the connections between private troubles, experience individually, and public issues, experienced collectively. It also explains how individual attitudes and behaviors are distributed in patterned and predictable ways according to the position of the individual society's institutional structure. These institutions include those of economy, government, family, education, and religion.

Sociologists are cross-disciplinary in their research as well as teaching. This means that they are active in related programs on campus, such as Criminology & Criminal Justice Studies, Urban and Regional Studies, Women's and Gender Studies, African and African-American Studies, Religious Studies, and Law and Society.

The field of sociology has grown in scope and importance as society has grown more complex and pluralistic. The modern individual is involved in a tightly integrated, sometimes conflicting, network of social groups, families, institutions, governmental, economic, educational and religious bodies, and specialized community organizations. Sociology studies the internal structure by which society is organized, the development and dynamics of the various groupings within it and the influences of these upon the individual. The Bachelor of Arts in Sociology provides a focus for general liberal education, as well as for preparation for careers in sociology. These include careers in social work and related human services, law, criminal justice, labor relations, public administration, business management, human relations, marketing and public opinion research.

**Internship, Co-op, and Research Opportunities**

Sociology students are provided with supervised field experience in a variety of occupational agencies focusing on social work and/or criminal justice. Students are placed in sites appropriate to their occupational goals. Students may also pursue cooperative educational opportunities, which provide paid career-related work experiences.

The CRJ Internship provides supervised field experience in a variety of occupational agencies focusing on criminal justice. Students are placed in sites appropriate to their occupational goals. Each intern spends a total of 80 hours on site and attends a weekly seminar. Students may elect to take this course for 3-6 credits.

The Sociology faculty encourages students to develop their own research projects in the form of independent studies (SOC 398/498). To find an appropriate faculty member for either one of these courses, students should start by consulting the list of faculty members and their specializations. Often, faculty members are involved in research in which students can take part as data collectors or analysts.

Sociology students frequently present the results of their research at undergraduate research conferences like Meeting of the Minds and the Michigan Undergraduate Research Forum, and even at professional meetings.

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**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Foreign Language Requirement**

Complete a two-semester beginning language sequence.

<table>
<thead>
<tr>
<th>Language I and II</th>
<th>Course Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient Greek I and II</td>
<td>MCL 105 and MCL 106</td>
</tr>
<tr>
<td>Arabic I and II</td>
<td>ARBC 101 and ARBC 102</td>
</tr>
<tr>
<td>Armenian I and II</td>
<td>MCL 111 and MCL 112</td>
</tr>
<tr>
<td>Chinese I and II</td>
<td>CHIN 101 and CHIN 102</td>
</tr>
<tr>
<td>French I and II</td>
<td>FREN 101 and FREN 102</td>
</tr>
<tr>
<td>German I and II</td>
<td>GER 101 and GER 102</td>
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</table>
**Pre-Major Requirement**

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>SOC 200</td>
<td>Understanding Society</td>
<td>3</td>
</tr>
<tr>
<td>or SOC 201</td>
<td>Contemporary Social Problems</td>
<td></td>
</tr>
</tbody>
</table>

**Major Requirements**

A minimum of 28 credit hours of SOC (sociology) courses is required in the major. Students must complete the following courses:

**Required courses:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>SOC 308</td>
<td>Sociological Theory</td>
<td>3</td>
</tr>
<tr>
<td>SOC/CRJ/HPS 410</td>
<td>Quantitative Research</td>
<td>4</td>
</tr>
<tr>
<td>SOC 413</td>
<td>Qualitative Research</td>
<td>3</td>
</tr>
<tr>
<td>SOC 497</td>
<td>Senior Research Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Electives or Concentration to Reach a Total of 28 Credit Hours**

Select any 15 credits of sociology (SOC) courses at the 300 level or above. Students also have the option to declare a concentration and take 15 credits from one of the following concentrations below:

**Applied and Community-Based Research (CASC)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC/AAAS/ HIST/HUM 304</td>
<td>Studies in Det.Hist. &amp; Culture</td>
<td></td>
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<tr>
<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
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<tr>
<td>SOC 411</td>
<td>Program Evaluation</td>
<td></td>
</tr>
<tr>
<td>SOC 430</td>
<td>Population Problems</td>
<td></td>
</tr>
<tr>
<td>SOC/CRJ 435</td>
<td>Urban Sociology</td>
<td></td>
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<tr>
<td>SOC/CRJ 440</td>
<td>Medical Sociology</td>
<td></td>
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<tr>
<td>SOC/CRJ 448</td>
<td>Comparative Health Care Sys</td>
<td></td>
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<tr>
<td>SOC/CRJ/ WGST 476</td>
<td>Inside Out Prison Exchange</td>
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<tr>
<td>SOC 477</td>
<td>Social Welfare</td>
<td></td>
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<tr>
<td>SOC 478</td>
<td>Social Work Internship</td>
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<tr>
<td>SOC 479</td>
<td>Comparative Hlth Systems:Trip</td>
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</tr>
<tr>
<td>SOC 482</td>
<td>Methods of Social Work Pract</td>
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</tr>
<tr>
<td>SOC 490</td>
<td>Advanced Topics in Sociology</td>
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</tr>
</tbody>
</table>

**Diversity, Inequality, and Social Justice (CASD)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC/AAAS/ HIST/HUM 304</td>
<td>Studies in Det.Hist. &amp; Culture</td>
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<tr>
<td>SOC/CRJ 309</td>
<td>Introduction to Law &amp; Society</td>
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</tr>
<tr>
<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
<td></td>
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<tr>
<td>SOC/AAAS/ CRJ 403</td>
<td>Minority Groups</td>
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</table>

**Diversity, Inequality, and Social Justice (CASD)**

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>SOC/CRJ 423</td>
<td>American Social Classes</td>
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<tr>
<td>SOC 426</td>
<td>Society and Aging</td>
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<tr>
<td>SOC 430</td>
<td>Population Problems</td>
<td></td>
</tr>
<tr>
<td>SOC/CRJ 435</td>
<td>Urban Sociology</td>
<td></td>
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<tr>
<td>SOC/AAAS 449</td>
<td>Black Family in Contemp Amer</td>
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<tr>
<td>SOC 450</td>
<td>Political Sociology</td>
<td></td>
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<tr>
<td>SOC 452</td>
<td>Marxism</td>
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<tr>
<td>SOC/CRJ 453</td>
<td>Sociology of Law</td>
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<tr>
<td>SOC 454</td>
<td>Mental Health and the Law</td>
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<tr>
<td>SOC 455/ ANTH 455/ CRJ 455/ WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
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<tr>
<td>SOC/HPS 456</td>
<td>Health Care and the Law</td>
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<td>SOC 460</td>
<td>America in a Global Society</td>
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<tr>
<td>SOC/CRJ/ WGST 461</td>
<td>Cops &amp; Cons: Women in Prison</td>
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<td>SOC/CRJ 465</td>
<td>Deviant Behavior/Soc Disorganz</td>
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<td>SOC/CRJ 466</td>
<td>Drugs, Alcohol, and Society</td>
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<td>SOC/CRJ 467</td>
<td>Drugs, Crime, and Justice</td>
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<td>SOC/CRJ 469</td>
<td>Juvenile Delinquency</td>
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<tr>
<td>SOC/AAAS/ CRJ 473</td>
<td>Race, Crime and Justice</td>
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<td>SOC/HPS/ WGST 475</td>
<td>Soc Construct Mental Illness</td>
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<td>SOC/CRJ/ WGST 476</td>
<td>Inside Out Prison Exchange</td>
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<td>SOC 477</td>
<td>Social Welfare</td>
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<td>SOC 478</td>
<td>Social Work Internship</td>
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**Families, Well-Being and Social Welfare (CASW)**

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>SOC/ANTH/ HUM/PSYC/WGST 303</td>
<td>Intro to Women's &amp; Gender Stud</td>
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<tr>
<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
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<td>SOC/HUM/ WGST 366</td>
<td>Sexualities, Genders, &amp; Bodies</td>
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<td>SOC 4075/ ANTH 407/ WGST 407</td>
<td>Sexual Praxis and Theory</td>
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<td>SOC/HUM/ WGST 409</td>
<td>Feminist Theories</td>
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<td>SOC 411</td>
<td>Program Evaluation</td>
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<tr>
<td>SOC/ANTH/ CRJ/WGST 412</td>
<td>Men and Masculinities</td>
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<tr>
<td>SOC 426</td>
<td>Society and Aging</td>
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<td>SOC 430</td>
<td>Population Problems</td>
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<td>SOC/CRJ 440</td>
<td>Medical Sociology</td>
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<td>SOC/CRJ 443/ PSYC 405/ WGST 405</td>
<td>Gender Roles</td>
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<td>Course Code</td>
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<td>SOC 445</td>
<td>The Family</td>
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<td>SOC/CRJ/ WGST 446</td>
<td>Marriage and Family Problems</td>
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<td>SOC/CRJ/ WGST 447</td>
<td>Family Violence</td>
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<td>SOC/AAAS 449</td>
<td>Black Family in Contemp Amer</td>
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<td>SOC/ANTH/ WGST 451</td>
<td>Family, Sexuality, Rights</td>
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<td>SOC 454</td>
<td>Mental Health and the Law</td>
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<td>SOC 4555/ ANTH 455/ CRJ 455/ WGST 4555</td>
<td>Immigrant Cultures and Gender</td>
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<tr>
<td>SOC/HPS 456</td>
<td>Health Care and the Law</td>
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<tr>
<td>SOC 457</td>
<td>Family, Aging and the Law</td>
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<tr>
<td>SOC/HPS/ WGST 475</td>
<td>Soc Construct Mental Illness</td>
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<td>SOC 478</td>
<td>Social Work Internship</td>
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<tr>
<td>SOC/ANTH/ COMM/WGST 481</td>
<td>Gender and Globalization</td>
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<td>SOC 482</td>
<td>Methods of Social Work Pract</td>
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<tr>
<td>SOC/WGST 484</td>
<td>Violence Against Women</td>
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**Cognates**

Students must also complete six credit hours in upper level cognate courses from the following: AAAS, ANTH, CRJ, ECON, HHS, HIST, POL, PSYC, STAT, WGST. Internships in these disciplines cannot be used to satisfy the cognate requirement.

6 Total Credit Hours

1 Double majors in sociology and psychology may use PSYC 425 in combination with PSYC 381 as a substitute for SOC 410.

**Notes:**

1. At least 18 of the 28 upper level credit hours in SOC must be elected at UM-Dearborn.
2. No more than 6 credit hours of Independent Study and no more than 6 credit hours of Independent Research within the Behavioral Sciences (anthropology (ANTH), psychology (PSYC) and sociology (SOC)) may be counted in the 120 credit hours required to graduate.
3. Any one course may be used to satisfy only one requirement within the major.

**Minor or Integrative Studies Concentration Requirements**

A minor or concentration consists of 12 credit hours of upper-level courses in sociology (SOC).

**SOC 200 Understanding Society 3 Credit Hours**

An introduction to the study of human groups with special attention devoted to an analysis of contemporary American society. (FW).

**SOC 215 Research Skills BSc 1 Credit Hour**

Full Title: Research Skills for the Behavioral Sciences This course teaches foundational research and critical-thinking skills necessary for the success of students in the Behavioral Sciences (including Anthropology, Psychology, and Sociology) in conducting university-level research projects, papers, and other research assignments. Students will learn important research skills like distinguishing between scholarly and non-scholarly sources of information, using library search tools to find peer-reviewed and scholarly sources, evaluating and analyzing information sources and using them to build informed opinions and arguments, integrating and synthesizing sources, and using sources ethically. Students will learn these skills through lectures, practice and by applying them through a series of assignments. (F, W, S)

**Restriction(s):**

Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

**SOC 302 Social Change 3 Credit Hours**

This course explores ways that social science theory and research may support people as they struggle for better lives and for a more just society. Students apply a sociological lens to critical issues such as racial and gender inequality, Islamophobia, climate change, mental health and disability rights, and the growing wealth gap. There are also opportunities to investigate areas of social struggle and social change not included on the syllabus. Students cannot receive credit for both SOC 201 and SOC 302. (W, YR)

**SOC 303 Intro to Women's & Gender Stud 3 Credit Hours**

This course provides an interdisciplinary overview of the key theories and topics in Women's and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women's and men's lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.

**Restriction(s):**

Cannot enroll if Class is Freshman

**SOC 304 Studies in Det.Hist. & Culture 3 Credit Hours**

This interdisciplinary course explores the political, social, and cultural history of Detroit by examining ways various groups and classes have interacted with and been shaped by structures of power and influence. The course highlights trade and commerce, newcomers, and the influence of organizations and institutions within the contexts of labor, race, ethnic, and religious histories and current affairs, and examines how these fit into the evolution of Detroit from the 19th century to the present. Where pertinent the influence of national and international movements included.
SOC 366  Sexualities, Genders, & Bodies  3 Credit Hours
This course introduces key questions and debates in lesbian, gay, bisexual, transgender, and queer studies. Through engagement with multidisciplinary sources, students explore how sexualities, genders, and bodies are constructed and contested, how these constructions vary in diverse contexts and historical moments, and what gaps remain in our knowledge of LGBTQ lives. (YR)

SOC 382  Social Psychology  3 Credit Hours
An introductory study of the interrelationships of the functioning of social systems and the behavior and attitudes of individuals. (YR)

Prerequisite(s): SOC 200 or PSYC 170 or PSYC 171 or SOC 201 or PSYC 101

SOC 388  LGBTQ Religious Experience  3 Credit Hours
This course explores intersections of religion, spirituality, and faith with sexuality and gender. Christianity and Islam receive particular attention. We also examine Lesbian, Gay, Bisexual, Transgender and Queer (LGBTQ) journeys within Buddhism, Hinduism, Judaism, new spiritual movements, and interfaith work. The course highlights intersections at three levels of analysis: the individual or personal level (how do LGBTQ identities intersect and interact with religious freedom and practice?), the interactional or community level (how do LGBTQ people experience belonging and rejection in diverse faith communities?) and the institutional level (how do the structures of these belief systems shape the life chances of LGBTQ people in society?). (W,S,AY)

SOC 390  Topics in Sociology  3 Credit Hours
Examination of problems and issues in selected areas of sociology. Title in Schedule of Classes will change according to course content. Course may be repeated for credit when specific topics differ. (F,W).

SOC 398  Directed Readings  1 to 3 Credit Hours
Reading assignments in sociology. No more than a total of six credit hours of SOC 398 and SOC 498 may be applied toward concentration. Permission of instructor required. (F,W,S).

Prerequisite(s): SOC 200 or SOC 201

SOC 403  Minority Groups  3 Credit Hours
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. Students cannot receive credit for both SOC 403 and SOC 503. (F,W).

Prerequisite(s): SOC 200 or SOC 201

SOC 4045  Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic, and political - in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a 'natural order', obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors, and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both SOC 404 and SOC 504.

Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

Can enroll if Level is Undergraduate

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SOC 398  Directed Readings  1 to 3 Credit Hours
Reading assignments in sociology. No more than a total of six credit hours of SOC 398 and SOC 498 may be applied toward concentration. Permission of instructor required. (F,W,S).

Prerequisite(s): SOC 200 or SOC 201

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SOC 409 Feminist Theories 3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women's and men's lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Student will not receive credit of both SOC 409 and SOC 509. (AY)
Prerequisite(s): WGST 275 or WST 275 or SOC 200 or SOC 201 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

SOC 410 Quantitative Research & Stats 4 Credit Hours
An introduction to methods of data collection and analysis. Elementary statistics data are analyzed using computerized statistics programs. A discussion of research design and the philosophy of social science is also included. Students cannot receive credit for both SOC 410 and SOC 510. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 411 Program Evaluation 3 Credit Hours
The application of social research procedures in assessing whether a human service program is needed, likely to be used, conducted as planned, and actually helps people in need. The course will cover research design and measurement as well as issues of how to get research findings utilized. Students cannot receive credit for both SOC 411 and SOC 511. (YR).
Prerequisite(s): SOC 200 or PSYC 170 or PSYC 171 or POL 101 or SOC 201 or PSYC 101
Restriciton(s):
Can enroll if Level is Undergraduate

SOC 412 Men and Masculinities 3 Credit Hours
This course addresses the question, "What is a man?", in various historical, cross-cultural, and contemporary contexts. A major focus on the social and cultural factors that underlie and shape conceptions of manhood and masculinity in America as well as in a variety of societies around the globe. (AY).
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriciton(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

SOC 413 Qualitative Research 3 Credit Hours
Qualitative research methods involve the observation and study of people in their everyday lives, in their taken-for-granted worlds. Qualitative research seeks to combine close empirical observation with analytic techniques that demand (and teach) personal and social self-consciousness as necessary to an understanding of the social worlds of others. This course in qualitative methods is designed to acquaint students with field research theories and techniques. Students will gain hands on experience in participant observation, interviewing and the use of sociological scholarship. Qualitative Research Methods will prepare students to gather data, focus the data in a social scientific manner, analyze the data, and then organize it in reportable form.
Prerequisite(s): SOC 308

SOC 423 American Social Classes 3 Credit Hours
Stratification of American communities and society; a review of the findings of major studies and an introduction to methodology. Students cannot receive credit for both SOC 423 and SOC 523. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 426 Society and Aging 3 Credit Hours
Personal, interpersonal, and institutional significance of aging and age categories. Sociological dimension of aging based on social, psychological, and demographic factors. Attention to social networks and institutionalization. Students cannot receive credit for both SOC 426 and SOC 526. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 430 Population Problems 3 Credit Hours
Social causes and consequences of population structure and change. How variations in fertility, mortality, and migration arise and how they affect society. Illustrations from the United States and a variety of developed and underdeveloped countries. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 433 Race/Ethnic Health 3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequality-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy interventions. (OC)

SOC 435 Urban Sociology 3 Credit Hours
A descriptive study of the form and development of the urban community with respect to demographic structure, spatial and temporal patterns, and functional organization. The relationship of city and hinterland. Social planning and its problems in the urban community. Students cannot receive credit for both SOC 435 and SOC 535. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 440 Medical Sociology 3 Credit Hours
An analysis of health and illness behavior from the point of view of the consumer, as well as of medical professionals, the structure, strengths, and weaknesses of the medical care delivery system in the U.S.; the impact of culture and personality on illness behavior; and a study of the institution of medicine and activities of health care professionals. Students cannot receive credit for both SOC 440 and SOC 540. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201

SOC 442 Sociology of Work 3 Credit Hours
Study of work roles in modern society. The impact of industrialization, professionalization, and unionization on the conditions of work, worker motivation, and job satisfaction. Career choice processes and career patterns, occupational status and prestige, and occupational associations are among the topics considered. Students cannot receive credit for both SOC 442 and SOC 542. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
SOC 443  Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Students cannot receive credit for both SOC 443 and SOC 543. (F,W,S).
Prerequisite(s): SOC 200 or PSYC 170 or PSYC 171 or SOC 201 or PSYC 101

SOC 445  The Family  3 Credit Hours
The family as an institution shaped by other aspects of society, as a social system with its own dynamics, and as a primary group affecting the lives of its members. Historical and contemporary materials from the United States and other cultures. Students cannot receive credit for both SOC 445 and SOC 545. (F,W,S).
Prerequisite(s): SOC 200 or SOC 201

SOC 446  Marriage and Family Problems  3 Credit Hours
Sociological analysis of problems encountered within the institution of marriage with particular reference to such issues as choosing a marriage partner, sexual adjustment, occupational involvement, conflict resolution, child rearing, divorce and readjustment. Students cannot receive credit for both SOC 446 and SOC 546. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 447  Family Violence  3 Credit Hours
Sociological analyses of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering, and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Students cannot receive credit for both SOC 447 and SOC 547. (YR)
Prerequisite(s): SOC 200 or SOC 301 or SOC 443 or PSYC 405 or WST 405 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 448  Comparative Health Care Sys  3 Credit Hours
An introduction and overview of the English, Swedish and People’s Republic of China health care systems. Focus on cultural context and other organizational characteristics, unique features, approaches and ability to solve problems. Emphasis on how the three systems help us understand the American health care system. Students cannot receive credit for both SOC 448 and SOC 548. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 449  Black Family in Contemp Amer  3 Credit Hours
The African-American family is examined in relationship to the historical and contemporary forces that have shaped its characteristic patterns of family life. These forces include the influence of slavery, urbanization, racial discrimination and urban poverty. The patterns of family life include parental roles, family structure, kinship relations, and gender roles. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 450  Political Sociology  3 Credit Hours
Examines how society affects the distribution and exercise of power through analyzing linkages between power, participation, and perspectives. Studies of political participation and social organization, ideology and social conflict, as well as political socialization, represent some of the major parameters. Students cannot receive credit for both SOC 450 and SOC 550. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 451  Family, Sexuality, Rights  3 Credit Hours
Full Course Title: Family, Sexuality, and Human Rights in a Changing World. This course investigates the changing possibilities for forming families and expressing sexuality, with a focus on how nation states and legal and cultural systems construct and respond to these changes. Selected topics include the meanings of sex, love, marriage, and relatedness in different historical moments; struggles for recognition of varied kinship and family arrangements, such as interracial, interfaith, same-sex, polygamous and multi-partner relationships; and new technologies and their implications for family life. (YR)
Prerequisite(s): (WGST 303 or SOC 303 or ANTH 303 or PSYC 303 or HUM 303) or (SOC 200 or SOC 201) or (ANTH 101 or ANTH 202)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

SOC 452  Marxism  3 Credit Hours
This survey of Marxist and neo-Marxist thought discusses philosophy, economic history, and socialism. Topics include Marx’s view of the nature of man, class conflict, the dialectic in history, the labor theory of value, monopoly capital and imperialism. Problems of socialist societies such as economic development and rule of elites will also be discussed. (AY).
Prerequisite(s): SOC 200 or POL 101 or ECON 201 or ECON 202 or SOC 201

SOC 453  Sociology of Law  3 Credit Hours
Various aspects of the relationship between law and society are explored. After a look at processes of law making, attention is turned to the administration of law. This involves a study of the activities of legislatures, courts, police, and correctional agents. Students cannot receive credit for both SOC 453 and SOC 553. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 454  Mental Health and the Law  3 Credit Hours
Courts and legislators now control much of the work of mental health professionals such as social workers, counselors, therapists, and psychologists. This course looks at problems encountered in putting the laws and policies into effect. These implementation problems are much the same in other areas of government action, such as poverty programs and pollution control. Students cannot receive credit for both SOC 454 and SOC 554. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 455  Sociology of Religion  3 Credit Hours
Religion as a social institution; its purposes, methods, structure, and beliefs, and its relation to other institutions. Students cannot receive credit for both SOC 455 and SOC 555. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
SOC 455  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including (1) formation and perseverence of immigrant communities and interethnic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles.
Prerequisite(s): ANTH 101 or WGST 303 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 456  Health Care and the Law  3 Credit Hours
A sociological study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children’s rights, access to health care. The emphasis will be on the organizational and personal consequences of legal requirements. Junior/Senior standing is a requirement. Students cannot receive credit for both SOC 456 and SOC 556. (AY)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

SOC 457  Family, Aging and the Law  3 Credit Hours
The law exerts a powerful impact on the family and the elderly. This course interprets the effects of laws concerning guardianship, competence, nursing home regulation, marriage, divorce, custody, adoption, abortion, and child sexual abuse.
Prerequisite(s): SOC 200 or SOC 201

SOC 458  Sociology of Education  3 Credit Hours
Education as a social institution; its purposes, methods, structure, and philosophy, and its relation to other institutions, particularly in the urban setting. Students cannot receive credit for both SOC 458 and SOC 558. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 460  America in a Global Society  3 Credit Hours
Social changes in America are studied from an internal and an external perspective. The internal dynamics of social change emphasize the role of social movement, e.g., the impact of the civil rights movement on American culture and politics. The external perspective sees America as part of a changing global society. The development of the capitalist world system from its origin in Western Europe to its present global reach is examined. Contemporary American social problems are examined in relation to America’s position in a rapidly changing world. Students cannot receive credit for both SOC 460 and SOC 560. (AY)
Prerequisite(s): SOC 200 or SOC 201

SOC 461  Cops & Cons: Women in Prison  3 Credit Hours
Course uses contemporary theories of gendered organizations to frame analyses of prison policies and practices in employment and incarceration as they reflect and reproduce gender inequalities. Analyses will be framed within a restorative justice model, that is, a critique of the current criminal justice system of retributive justice and a paradigm of what a alternative system could be.
Prerequisite(s): SOC 200 or SOC 201 or WST 275 or WGST 275 or CRJ 240 or CRJ 300 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 465  Deviant Behavior/Soc Disorganz  3 Credit Hours
A general analysis of the concept of social deviance and social disorganization: factors producing each condition, the effects of social control measures on the course of deviance and disorganization consequences for the social system, and the relationship between the two. Students cannot receive credit for both SOC 465 and SOC 565. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate

SOC 466  Drugs, Alcohol, and Society  3 Credit Hours
Analyses of the sociology of substance use and abuse. Provides a sociological framework for understanding issues and evaluating our nation’s responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American society. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 467  Drugs, Crime, and Justice  3 Credit Hours
Provides a comprehensive analysis of the current state of research on interactions between crime and drug use. Examines drug distribution, organization of drug systems, and mechanisms of social control of drug systems. Analyzes the social problems associated with drugs and crime. The course also focuses on drug-law enforcement and public policy strategies for dealing with drugs and crime. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 469  Juvenile Delinquency  3 Credit Hours
A general analysis of the concept of societal frameworks for understanding issues and evaluating our nation’s responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American society. Prerequisite or permission of instructor. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 473  Race, Crime and Justice  3 Credit Hours
This course is an analysis of race and its relation to crime in the criminal justice system. Students will analyze and interpret the perceived connection between race and crime, while exploring the dynamics of race, crime, and justice in the United States. This course is designed to familiarize students with current research and theories of racial discrimination within America’s criminal justice system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman
SOC 475  Sociocultural Mental Illness  3 Credit Hours
Diversity Issues in Mental Health explores varied cultural descriptions and models of mental illness. By focusing on the ways that culture shapes how people experience, and respond to, mental illness this class explores cultural representations of mental illness, ranging from discrete illness resulting from a chemical imbalance to a profound threat to order. We seek to understand the cultural, personal, and political underpinnings of mental illness and medical practices in societies throughout the world. The course utilizes an interdisciplinary perspective, drawing from multiple sources of information regarding mental health issues, including feminism, psychiatry, history, sociology, and literature. Issues raised throughout the course include the ways gender, race, culture, religion, and stigma influence the diagnosis of mental illness, patterns of help-seeking behavior, formation of comprehensive mental health policy, and treatment options.
Prerequisite(s): SOC 200 or SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

SOC 476  Inside Out Prison Exchange  4 Credit Hours
This community-based course, taught in a local correctional facility, brings university students and incarcerated students together to study as peers. Together students explore issues of crime and justice, drawing on one another to create a deeper understanding of how these issues affect our lives as individuals and as a society. The course creates a dynamic partnership between UMD and a correctional facility to allow students to question approaches to issues of crime and justice in order to build a safer and more just society for all. The course encourages outside (UMD) students to contextualize and to think deeply about what they have learned about crime and criminals and to help them pursue the work of creating a restorative criminal justice system; it challenges inside students to place their life experiences into larger social contexts and to rekindle their intellectual self-confidence and interest in further education.
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 477  Social Welfare  3 Credit Hours
The practice of social work is examined within the context of the development of the social service professions and welfare institutions in American society. Social welfare is a concept that encompasses the provision of material resources, as well as regulation and protection of clients. Changes in welfare policy are analyzed in relation to other institutional changes in American society. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 478  Social Work Internship  3 to 6 Credit Hours
Provides field experience in social welfare or criminal justice agencies, e.g., for children/adolescents, in residential programs, in abuse remediation, in probation, for chemical dependencies, in victim advocacy, for elderly, in prisons, for special needs populations, in court services, and for families and communities. Supervision by approved field instructors. An internship of 80 hours is required for three (3) credits. Instructor and student will work together to determine appropriate intern placement. Approval of instructor is required. (OC).
Prerequisite(s): SOC 200 or SOC 201

SOC 479  Comparative Health Systems: Trip  3 Credit Hours
A unique combination of lectures, field trips, visits with general practitioners, specialists, hospital observations, talks with health policy planners, researchers, and many others. Personal experience in two health care systems. Permission of instructor. Junior/Senior standing required. Students cannot receive credit for both SOC 479 and SOC 579. (AY).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior

SOC 481  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization re-formulates identities and locations and the political possibilities they create. (AY).
Prerequisite(s): ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Arts, Sciences, and Letters

SOC 482  Methods of Social Work Practice  3 Credit Hours
Examination of social work practice methods and approaches to social problems, contexts of practice and targets of change. Focus is on knowledge and skills each practice method requires to effect personal and social change. (YR).
Prerequisite(s): SOC 200 or SOC 201

SOC 483  Images of Organizations  3 Credit Hours
Formal bureaucratic organizations such as government agencies, hospitals, and colleges are a distinctive feature of modern industrialized societies. Analysis of types of formal organizations, their goals, structure, and consequences for intra- and inter-organizational behavior helps to understand how to deal with a complex world. Students cannot receive credit for both SOC 483 and SOC 583. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Undergraduate
SOC 484 Violence Against Women 3 Credit Hours
Course examines local and global social violence against women outside family and other intimate relationships. Students consider violations against women's human rights through the life cycle, which are often sanctioned under the guise of cultural practices and misinterpretations of religious tenets. Topics include sex-selective abortion and female infanticide (the "missing millions"); female genital mutilation and cosmetic surgeries; prostitution and pornography; trafficking in women; sexual harassment; and women's experiences of war as soldiers, non-combatants and refugees. Topics are "paired", that is, students compare understandings of Western and non-Western social practices related to gender. Students examine both institutionalized sexism and racism, as part of political, economic, and social systems, and sexism and racism as realities affecting individual women's lives.

Prerequisite(s): SOC 200 or SOC 201 or WGST 303 or HUM 303 or PSYC 303 or ANTH 303 or SOC 303 or WGST 375 or HUM 275 or PSYC 275 or SOC 275 or ANTH 275 or WST 275
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

SOC 490 Advanced Topics in Sociology 3 Credit Hours
Examination of problems and issues in selected areas of sociology. Title as listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs.

SOC 490A Advanced Topics in Sociology 3 Credit Hours
TOPIC: Diasporas and (Trans) Nationalism: Gender, Race, and Post-Coloniality. An interdisciplinary and comparative inquiry into historical & contemporary linkages between gender regimes, national formations, and legacies of colonialism as they interact at "home" and in "diasporas." Using multi-media and multi-genre pedagogical tools (conceptual and methodological writings; narratives and biographies; guest lectures; films), we study & critique different perspectives on how the dialectics of geography, positionality, and social structures shape the ways in which we imagine "home", "homeland", and "back home." We examine gendered politics of the colonial project 1) in early days of colonialization; 2) during struggles of decolonization; and 3) "post-colonial" geographies’ While becoming familiar with "classics" in nationalism/transnationalism, gender, colonialism, and diaspora, we will explore their applicability to specific case studies in European and American contexts as well as in Africa, Asia, and the Middle East.

SOC 497 Senior Research Seminar 3 Credit Hours
This course is intended as the culmination of a student’s prior work in sociology. Each student will conduct an applied research project that draws upon sociological concepts and issues. The product of this research will be an essential component of the student’s concentration portfolio.

Prerequisite(s): SOC 410

SOC 498 Independent Study 1 to 3 Credit Hours
Analytical assignments in sociology. No more than a total of six credit hours of SOC 398 and SOC 498 may be applied toward concentration. Permission of instructor required. (F,W,S).

Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Urban and Regional Studies

The program in Urban and Regional Studies (URST) provides opportunities for in-depth study of some of the major challenges facing individuals and groups living and working in major metropolitan regions such as Detroit.

These challenges include economic development; urban poverty and income inequality; preserving and promoting culture, architecture and art; land use conflicts; and the provision of adequate and sustainable transportation and housing services. The focus of the URST program is to provide you with the knowledge, techniques and critical analytical skills that will enable you to effectively participate in changing your city and region.

The URST program is interdisciplinary by design, meaning that courses draw upon a variety of traditional academic disciplines – e.g. Anthropology, Economics, English, Geography, History and Sociology. Students are encouraged to rigorously and creatively integrate the theory and methods learned in these courses. In addition, a unique feature of the program is that students gain hands-on experience by working in the community through internship, academic service learning and/or community-based research.

Pursuing a degree in Urban and Regional Studies at UM-Dearborn offers you the opportunity to combine real-world practice and theory. Students can specialize in areas such as urban and regional policy, community development, urban design and the environment.

Help change the world (or your corner of it) by pursuing a degree in Urban and Regional Studies at UM-Dearborn!

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)
Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement
Complete a two-semester beginning language sequence.

- Ancient Greek I and II
- Arabic I and II
- Armenian I and II
- Chinese I and II
- French I and II
- German I and II
- Latin I and II
- Spanish I and II
- MCL 105 and MCL 106
- ARBC 101 and ARBC 102
- MCL 111 and MCL 112
- CHIN 101 and CHIN 102
- FREN 101 and FREN 102
- GER 101 and GER 102
- LAT 101 and LAT 102
- SPAN 101 and SPAN 102

The Major
The Urban and Regional Studies major requires the completion of 36 credits. The majority of these credits are filled through courses in three separate concentration tracks:

- Concentration Track I Urban Problems and Policy
- Concentration Track II Community Development, Culture and History
- Concentration Track III Environment, Design and Space

Students select one concentration track from which they must take a specific number of credits. They take the balance of their concentration track-related credits from the other two tracks.

Students must also take a specific number of credits in academic-based community research through an internship, independent study, or upper-level courses designated as academic service-learning.

The three-credit Urban and Regional Studies: Theory and Practice (URS 300) provides an introduction to urban and regional studies, and the three-credit Senior Capstone in Community Research (URS 450) rounds out the required URST courses. Students take additional credits within a single academic discipline (i.e., cognate courses) to ensure a well-rounded understanding of urban issues and how to study and address them.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>URS 300</td>
<td>Urban and Regional Studies</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select 12 credit hours in one of the three concentration tracks (see below for choices)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Select 12 credit hours from the other two concentration tracks</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Select 6 credit hours of academic-based community research satisfied through any combination of the following:</td>
<td>6</td>
</tr>
<tr>
<td>URS 485</td>
<td>Urban Regional Stud Internship ¹</td>
<td></td>
</tr>
<tr>
<td>URS 450</td>
<td>SiD–Field Internship</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independent Study ²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Designated approved 300/400, 3000/4000 level academic service learning (ASL) courses ³</td>
<td></td>
</tr>
<tr>
<td>URS 450</td>
<td>Sr Capstone in Community Rsrch</td>
<td>3</td>
</tr>
</tbody>
</table>

Portfolio - approval required by the Urban and Regional Studies Program Advisor

Total Credit Hours 36

¹ Students may elect to participate in any CASL Internship program with approval from their URST faculty advisor by Petition and the Internship Program Director.
² 3 credits of which can also be used to satisfy the credit requirements in a single track, with the approval of the URST program faculty director by Petition.
³ For the list of ASL courses for each semester, see Civic Engagement http://umdearborn.edu/asl/.

Concentration Tracks
Must declare one of the following concentration tracks:

Concentration Track I: Urban Problems and Policy (CAUP)

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>ECON 305</td>
<td>Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECON/AAAS/ WGST 325</td>
<td>Economics of Pov and Discrm</td>
<td>3</td>
</tr>
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<td>ECON 482</td>
<td>Regional Economics</td>
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</tr>
<tr>
<td>ECON 483</td>
<td>Urban Economics</td>
<td>3</td>
</tr>
<tr>
<td>POL 313</td>
<td>American State Government</td>
<td>3</td>
</tr>
<tr>
<td>POL 322</td>
<td>Mich Gov, Pol, &amp; PUBL Policy</td>
<td>3</td>
</tr>
<tr>
<td>POL/CRJ 323</td>
<td>Urban Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 334</td>
<td>Organizing and Leadership</td>
<td>3</td>
</tr>
<tr>
<td>POL 360</td>
<td>American Policy Process</td>
<td>3</td>
</tr>
<tr>
<td>POL 4605</td>
<td>Science, Tech &amp; Pub Policy</td>
<td>3</td>
</tr>
<tr>
<td>POL 466</td>
<td>Politics&amp;Policies Soc Welfare</td>
<td>3</td>
</tr>
<tr>
<td>POL/ENST 467</td>
<td>Food Politics and Policy</td>
<td>3</td>
</tr>
<tr>
<td>POL 484</td>
<td>Revitalizing Cities</td>
<td>3</td>
</tr>
<tr>
<td>POL 489</td>
<td>Seminar in Urban Politics</td>
<td>3</td>
</tr>
<tr>
<td>SOC/CRJ 350</td>
<td>Poverty and Inequality</td>
<td>3</td>
</tr>
<tr>
<td>SOC/AAAS/CRJ 403</td>
<td>Minority Groups</td>
<td>3</td>
</tr>
</tbody>
</table>
### Concentration Track II: Community Development, Culture, History (CAUC)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAS/HIST 368</td>
<td>Black Exp in US: 1865-Present</td>
<td>3</td>
</tr>
<tr>
<td>AAAS/ENGL 389</td>
<td>Odyssey of Black Men in Amer</td>
<td>3</td>
</tr>
<tr>
<td>AMST 306/COMM 306/ENGL 306/HIST 3602/SOC 306</td>
<td>Comparat. American Identities</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 376</td>
<td>Power &amp; Privilege in SE Mich</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 410</td>
<td>Archaeological Field School</td>
<td>3</td>
</tr>
<tr>
<td>ANTH/CRJ/WGST 455</td>
<td>Immigrant Cultures and Gender</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 426</td>
<td>City of Ancient Rome</td>
<td>3</td>
</tr>
<tr>
<td>COML/HUM 355</td>
<td>Urban Voices: France and Italy</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/HUM 356</td>
<td>Reading Urban Monstrosity</td>
<td>3</td>
</tr>
<tr>
<td>ECON/HIST 361</td>
<td>U S Economic History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3380</td>
<td>The European City, 1750-2000</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3601</td>
<td>Michigan History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3665</td>
<td>Automobile in American Life</td>
<td>3</td>
</tr>
<tr>
<td>HIST/STS 3695</td>
<td>American City</td>
<td>3</td>
</tr>
<tr>
<td>HIST/STS 383</td>
<td>Labor in America</td>
<td>3</td>
</tr>
<tr>
<td>SOC/AAAS/HIST/ Studies in Det.Hist. &amp; Culture HUM 304</td>
<td>Dissed: Differ, Power, Discrim</td>
<td>3</td>
</tr>
<tr>
<td>SOC 4045/AAAS 404/WGST 404</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>SOC/CRJ 423</td>
<td>American Social Classes</td>
<td>3</td>
</tr>
<tr>
<td>SOC/AAAS 449</td>
<td>Black Family in Contemp Amer</td>
<td>3</td>
</tr>
<tr>
<td>SOC 458</td>
<td>Sociology of Education</td>
<td>3</td>
</tr>
<tr>
<td>URS 360</td>
<td>SiD–20th Cent Detroit History</td>
<td>3</td>
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</tbody>
</table>

### Concentration Track III: Environment, Design and Space (CAUE)

<table>
<thead>
<tr>
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<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ANTH/STS 345</td>
<td>Cultural Ecology and Evolution</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 365</td>
<td>Modern Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARTH 375</td>
<td>Urban Design Perspectives</td>
<td>3</td>
</tr>
<tr>
<td>ESCI/GEOG/GEOL 305</td>
<td>Intro to GIS</td>
<td>4</td>
</tr>
<tr>
<td>ENST/STS 301</td>
<td>Concepts of Environmentalism</td>
<td>3</td>
</tr>
<tr>
<td>ENST/POL/STS 325</td>
<td>Environmental Politics</td>
<td>3</td>
</tr>
<tr>
<td>ENST/ESCI 330</td>
<td>Land Use Planning and Mgmt</td>
<td>4</td>
</tr>
<tr>
<td>ENST/GEOl 340</td>
<td>Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>ENST 456</td>
<td>Ecological Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

### Cognates

Six credit hours of upper-level (300/400; 3000/4000 level, excluding internships, co-ops and MATH 385, MATH 386, MATH 387) coursework in a single discipline, in addition to any courses already elected in that discipline used to satisfy urban and regional studies requirements. Cognate courses will provide supporting skills or contexts for the study of urban issues.

### Notes:

1. At least 18 of the 36 upper level credit hours required in the major must be elected at UM-Dearborn.
2. In satisfying the academic based community research requirement, students must obtain approval of the URST faculty program advisor for internships, independent study, and “other” approved forms of academic service learning, prior to enrolling in the courses. Courses already designated as academic service learning (ASL, 300/400; 3000/4000 level only) do not require approval. ASL courses vary by semester.

### Minor or Integrative Studies Concentration Requirements

The minor/concentration requires 15 credit hours of upper-level coursework including URS 300 and at least one course from each of the three tracks below.

**Track I: Urban Problems and Policy: Course attribute CAUP**

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<tr>
<td>SOC/CRJ/HHS 410</td>
<td>Quantitative Research</td>
<td>4</td>
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### Track III: Environment, Design, and Space: Course attribute CAUE

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<tr>
<td>ARTH 365</td>
<td>Modern Architecture</td>
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<tr>
<td>ARTH 375</td>
<td>Urban Design Perspectives</td>
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<td>ESCI/GEOG/GEOL 305</td>
<td>Intro to GIS</td>
<td>4</td>
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<td>ENST/STS 301</td>
<td>Concepts of Environmentalism</td>
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<td>ENST/POL/STS 325</td>
<td>Environmental Politics</td>
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<td>ENST/ESCI 330</td>
<td>Land Use Planning and Mgmt</td>
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<td>ENST/GEOL 340</td>
<td>Remote Sensing</td>
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<td>ENST 456</td>
<td>Ecological Economics</td>
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<tr>
<td>GEOG/ENST 300/ 308</td>
<td>Urban Geography</td>
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### Track II: Community Development, Culture, and History: Course attribute CAUC

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<tr>
<td>AAAS/HIST 368</td>
<td>Black Exp in US: 1865-Present</td>
<td>3</td>
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<tr>
<td>AAAS/ENGL 389</td>
<td>Odyssey of Black Men in Amer</td>
<td>3</td>
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<td>AMST 300/ COMM 306/ENGL 306/HIST 3602/SOC 306</td>
<td>Comparat. American Identities</td>
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<td>ANTH 376</td>
<td>Power &amp; Privilege in SE Mich</td>
<td>3</td>
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<tr>
<td>ANTH 410</td>
<td>Archaeological Field School</td>
<td>3</td>
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<tr>
<td>ANTH/CRJ/WGST 455</td>
<td>Immigrant Cultures and Gender</td>
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<td>ARTH 426</td>
<td>City of Ancient Rome</td>
<td>3</td>
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<tr>
<td>COML/HUM 355</td>
<td>Urban Voices: France and Italy</td>
<td>3</td>
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<tr>
<td>ENGL/HUM 356</td>
<td>Reading Urban Monstrosity</td>
<td>3</td>
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<tr>
<td>ECON/HIST 361</td>
<td>U S Economic History</td>
<td>3</td>
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<td>HIST 3380</td>
<td>The European City, 1750-2000</td>
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<td>HIST 3601</td>
<td>Michigan History</td>
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<td>HIST 3655</td>
<td>Automobile in American Life</td>
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<td>HIST/STS 3695</td>
<td>American City</td>
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<td>HIST/STS 383</td>
<td>Labor in America</td>
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<td>SOC/AAAS/HIST/ HUM 304</td>
<td>Studies in Det.Hist. &amp; Culture</td>
<td>3</td>
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<td>SOC 4045/AAAS 404/WGST 404</td>
<td>Dissed: Differ, Power, Discrim</td>
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<td>SOC/CRJ 423</td>
<td>American Social Classes</td>
<td>3</td>
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<td>SOC/AAAS 449</td>
<td>Black Family in Contemp Amer</td>
<td>3</td>
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<tr>
<td>SOC 458</td>
<td>Sociology of Education</td>
<td>3</td>
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<tr>
<td>URS 360</td>
<td>SiD--20th Cent Detroit History</td>
<td>3</td>
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</tbody>
</table>

### URS 300 Urban and Regional Studies  3 Credit Hours

In this course we will explore the field of urban and regional studies. The scope of readings is inter-disciplinary, spanning the environmental, aesthetic, social, economic, geographic, historical, political and cultural aspects of cities, suburbs and regions. The interrelationship between the spatial organization of a city, patterns of social and economic inequality, delivery of services, the relationship between culture and public space, as well as the processes of urban and regional change will all be considered. Problems such as race and class inequality will also be examined. Special attention will be given to issues of relevance in the Detroit metropolitan region (e.g. spatial, economic, cultural, political and social impacts of the loss of manufacturing jobs). Students will be introduced to methods of social scientific analysis and will begin to apply those methods to researching urban and regional community groups, enterprises and social movements.

### URS 301 SiD--Field Internship  3 Credit Hours

Full Course Title: Semester in Detroit: Field Internship This course serves as a field internship course for the Semester in Detroit (SiD) program. Students in this course work for 200 hours in an internship with a community-based organization in Detroit over 12 weeks (average of 16 hours per week). They also participate in an internship reflection seminar (co-requisite). Students must apply to, and be accepted by, UM-Ann Arbor’s in Detroit program to enroll in this course. (F,W,S)

**Corequisite(s):** SSCI 302

### URS 302 SiD--Intern Seminar  2 Credit Hours

This course serves as a core course for the Semester in Detroit (SiD) program. The primary purpose of this class is to provide a supportive, yet challenging learning space for reflecting on your Detroit internship experiences this semester. There are three main sources of material for this class: you, the internship, and Detroit. While, in theory, each is distinct, in practice, all three are intertwined and interact and affect one another. Your challenge will be learning to see more clearly the interactions among these domains. Students must apply to, and be accepted by, UM-Ann Arbor’s Semester in Detroit program to enroll in this course.

### URS 360 SiD--20th Cent Detroit History  3 Credit Hours

This course serves as the core course for the Semester in Detroit (SiD) program. It examines the transformation of Detroit from the late 19th, through the 20th and into the 21st Centuries. Our goal is to identify the main forces and patterns of change in Detroit’s past that have shaped the contemporary city you encounter today. Thus, the course is organized chronologically, but we will be exploring the city’s history alongside consideration of contemporary social issues, challenges, and debates. Course material will include a range of readings, films, and excursions. Through discussion of this material and in written assignments, the course encourages you to develop your own interpretation of the circumstances, challenges and opportunities currently facing the city. Students must apply to, and be accepted by, UM-Ann Arbor’s Semester in Detroit program to enroll in this course.

### URS 390 Topics Urban &Regional Studies  1 to 3 Credit Hours

Problems and issues in selected areas of urban and regional studies. Title as listed in Schedule of Classes changes according to content. Course may be repeated for credit when specific topic differs.
URS 450 Sr Capstone in Community Rsrch  3 Credit Hours
The capstone course is designed to assist students in integrating the concepts, theories, and methods of inquiry or urban studies into research for or in the surrounding metropolitan area. Open to students in urban and regional studies who have completed their community-based learning requirement for the concentration.

URS 485 Urban Regional Stud Internship  3 to 6 Credit Hours
The internship offers students the opportunity to learn and apply concepts learned in Urban and Regional Studies coursework to real world settings in municipal and regional government offices, non-profit and community organizations, or businesses dedicated to design, development, or data. The student has 8-16 hours of unpaid work per week under the guidance of a faculty advisor. Primarily for junior or senior URS students or other qualified applicants. Up to 6 credits can be used to fulfill the community-based research requirement for urban and regional studies concentrators, with the approval of the URS director.
Prerequisite(s): URS 300
Restriction(s):
Cannot enroll if Class is Freshman

URS 499 Independent Study  3 Credit Hours
Readings, community-based research and analytical assignments in accordance with the needs and interests of the student and approval of the instructor. Students must submit a written proposal of study for approval. In addition, students electing to take this course in partial fulfillment of their community-based research must get approval from the Director of the Urban and Regional Studies program. (F,W,S)

Women's and Gender Studies

Women's and Gender Studies at the University of Michigan - Dearborn is a vibrant interdisciplinary community of faculty, students and alumni dedicated to excellence in scholarship, teaching, learning and activism.

Are you interested in a program of study that allows you to pursue your interest in gender equity and social justice while developing the skills employers and competitive graduate programs desire?

In Women's and Gender Studies you will examine the ways that gender – through its connection with other forms of power such as race, class, sexuality and national location – shape lives, bodies, institutions and worlds.

You will also develop your analytical and critical thinking skills, and your ability to integrate and apply knowledge across the disciplines – skills that are needed to succeed in today’s ever-changing and dynamic labor market.

The community service orientation of our program provides experiences that will contribute to both your intellectual growth and post-graduate employment opportunities.

Our students are campus and community leaders. They are Difference Makers, Honors scholars, Commencement speakers, and Chancellor medallion winners. Graduates of our program have gone on to successful careers in social work, health care, education, arts administration, human resources and community change, and scholarship funded graduate study in a variety of fields.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:

The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Foreign Language Requirement

Complete a two-semester beginning language sequence.

Ancient Greek I and II  MCL 105 and MCL 106
Arabic I and II  ARBC 101 and ARBC 102
Armenian I and II  MCL 111 and MCL 112
Chinese I and II  CHIN 101 and CHIN 102
French I and II  FREN 101 and FREN 102
German I and II  GER 101 and GER 102
Latin I and II  LAT 101 and LAT 102
Spanish I and II  SPAN 101 and SPAN 102
## Major Requirements

The major requires 30 credit hours in Women's and Gender Studies (WGST):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>WGST/ANTH/</td>
<td>Intro to Women's &amp; Gender Stud</td>
<td>3</td>
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<tr>
<td>HUM/PSYC/SOC 303</td>
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<tr>
<td>WGST/HUM/SOC</td>
<td>Feminist Theories</td>
<td>3</td>
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<td>WGST/HUM/SOC</td>
<td>Feminist Theories</td>
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<tr>
<td>Gender, Culture, and Representation Courses (CAGS)</td>
<td>6</td>
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<td>WGST/ARTH/</td>
<td>Women in Medieval Art</td>
<td>3</td>
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<tr>
<td>HUM/RELS</td>
<td></td>
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<tr>
<td>WGST/HUM/</td>
<td>Women Musicians/West Mus Hist</td>
<td>3</td>
</tr>
<tr>
<td>MHIS 337</td>
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<tr>
<td>WGST/HUM/</td>
<td>Sexualities, Genders, &amp; Bodies</td>
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<td>SOC 366</td>
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<td>WGST/LING</td>
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<td>WGST/ENGL</td>
<td>Gender Issues in Literature</td>
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<tr>
<td>WGST/SOC</td>
<td>LGBTQ Religious Experience</td>
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<tr>
<td>WGST/AAAS/</td>
<td>Black Women, Rel &amp; Spirituality</td>
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<td>Images of Women in Germany</td>
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<td>WGST/ARTH/</td>
<td>Women in Classical Antiquity</td>
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<td>WGST/HUM</td>
<td>Writing Women In Renaissance</td>
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<td>WGST/ENGL</td>
<td>20C/21C Women Authors</td>
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<td>WGST/COMM</td>
<td>Gender and Media Studies</td>
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<td>Arguing Feminism: Rhetoric</td>
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<td>WGST/AAAS/</td>
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<td>HUM 4705</td>
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<td>WGST/ENGL</td>
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WGST/AAST/ENGL 473 Arab American Women Writers

WGST/ANTH/COMM/SOC 481 Gender and Globalization

WGST/ENGL 486 Queer Theory & Literature

WGST/ENGL 487 Monsters, Women & the Gothic

WGST/HIST 4505 Feminism & Mod. Mid. East

WGST 4555/ANTH 4555/CRJ 4555/SOC 4555 Immigrant Cultures and Gender

WGST/NSCI 325/STS 326 Gender, Science & Engineering

WGST 326/ECON 325 Poverty and Discrimination

WGST/HPS 336 Perspectives in Women's Health

WGST/HIST/RELS 338 Women & Islam Mid East to 1900

WGST/CRJ/POL 362 Women, Politics, and the Law

WGST/HUM/SOC 366 Sexualities, Genders, & Bodies

WGST/HIST 370 Women in America-Hist Perspect

WGST/SOC 388 LGBTQ Religious Experience

WGST/AAAS/RELS 393 Black Women, Rel & Spirituality

WGST/AAAS 404/SOC 4045 Dissed: Differ, Power, Discrim

WGST 405/CRJ 443/PSYC 405/SOC 443 Gender Roles

WGST 408 Sex, Gender and the Body

WGST/ANTH/CRJ/SOC 412 Men and Masculinity

WGST/ANTH 420 Kinship and Marriage

WGST/HPS 436 Reproductive Health Policy

WGST/CRJ/SOC 446 Marriage and Family Problems

WGST/CRJ/SOC 447 Family Violence

WGST/ANTH/SOC 451 Family, Sexuality, Rights

WGST/CRJ/SOC 461 Cops & Cons: Women in Prison
### Minor or Integrative Studies

**Concentration Requirements**

The minor/concentration requires 15 credit hours of upper-level WGST coursework including WGST 303, Introduction to Women’s and Gender Studies.

**WGST 303  Intro to Women’s & Gender Stud 3 Credit Hours**

This course provides an interdisciplinary overview of the key theories and topics in Women's and Gender Studies. Special attention is given to how gender intersects with class, race, nationality, religion and sexuality to structure women's and men's lives. Students are also introduced to methods of gender analysis and will begin to apply these methods to topics such as women and health, gender roles in the family, violence against women, and gendered images in the mass media.

**Restriction(s):**

Cannot enroll if Class is Freshman

**WGST 315  Body Image and Culture 3 Credit Hours**

This course examines the biological and sociocultural construction of body image in both men and women. We explore such cultural and social practices as nudity, tattooing, piercing, scarification, dietary habits, physical activity and sports performance and their associated myths and realities. We explore how the human body is a terrain of contested meaning within society. The course provides an examination of the causes and consequences of women's poor body image, contemporary and historically. Course materials include case studies from North America, Europe, Africa, Asia and the Pacific.

**Prerequisite(s):**

ANTH 101 or WST 275 or WGST 275 or WGST 303 or SOC 303 or SOC 303 or HUM 303 or SOC 303 or HUM 303 or SOC 303 or HUM 303 or SOC 303

**WGST 325  Gender, Science & Engineering 3 Credit Hours**

Explores some of the history of women in science and engineering, the current status of women in science and engineering, and feminist theory in research. Topics include cultural influences on women in science and engineering, careers and life balance, and a feminist approach to scientific and engineering teaching and research.

**Prerequisite(s):**

NSCI 101 or NSCI 120 or NSCI 121

**WGST 326  Poverty and Discrimination 3 Credit Hours**

An analysis of the economic aspects of poverty and discrimination. Emphasis on the theoretical economic causes of poverty and the economic bases for discriminatory behavior, the impact of poverty and discrimination on individuals and society and the effect of reform policies on the two problems.

**Prerequisite(s):**

ECON 201 and ECON 202

**WGST 335  Women in Medieval Art 3 Credit Hours**

Women have often been regarded as the second sex of the middle ages due to the misogynistic attitudes of that era. Recent scholarship, however, has unearthed a significantly more complex picture. Through a study of visual representations of women in medieval art, this course will examine women's roles in the creation and patronage of art and literature, economic and family issues, and women's participation in new and innovative forms of religious piety.

**Prerequisite(s):**

ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106 or WGST 275 or WGST 303 or SOC 275 or SOC 303 or HUM 275 or HUM 303 or ANTH 275 or ANTH 303 or PSYC 275 or PSYC 303 or SOC 275 or SOC 303 or WST 275

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### Notes:

1. A maximum of 44 credit hours in WGST may count in the 120 credits hours required to graduate.
2. At least 15 of the 30 upper level credit hours required in WGST must be elected at UM-Dearborn.

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<tr>
<th>Concentration Courses</th>
<th>Description</th>
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<tr>
<td>WGST/PSYC 3955</td>
<td>Women/Leadership/Social Change</td>
</tr>
<tr>
<td>WGST/PSYC 405</td>
<td>Gender and Globalization</td>
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<tr>
<td>WGST/HIST 3385</td>
<td>Sex, War, and Violence</td>
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<tr>
<td>WGST/HIST 3651</td>
<td>Diversity and the Workplace</td>
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<tr>
<td>WGST/HIST 4505</td>
<td>Feminism &amp; Mod. Mid. East</td>
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<tr>
<td>WGST/HIST 4650</td>
<td>Sem in US Women's History</td>
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**Community-Based Experiential Learning (CAEL)**

Select 3 credit hours from the following: 3

- WGST/CRJ/POL 362   Women, Politics, and the Law
- WGST/HIST 3651     Women/Leadership/Social Change
- WGST/CRJ/SOC 476   Inside Out Prison Exchange
- WGST 478           Women and Gender Studies Intern

**Capstone Experience (CACX)**

Select 3 credit hours from the following: 3

- WGST 408           Sex, Gender and the Body
- WGST/HPS 436       Reproductive Health Policy
- WGST/HPS/SOC 475   Diversity Issues in Mental Health

**WGST Electives**

Select 6 credit hours of coursework in 300/3000; 400/4000 level WGST courses 6

Total Credit Hours 30

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1 Any 3 credit hours UM-Dearborn internship or WGST 498 with approval of the WGST program director by Petition.
WGST 336  Perspectives in Women’s Health  3 Credit Hours  
Topic: Perspectives in Women’s Health. This course examines women’s health issues across the human lifespan, using feminist and sociocultural perspectives. Topics to be explored include the social construction of women’s sexuality, reproductive options, health care alternatives and risk for physical and mental illness. Attention to the historical, economic, and cultural factors that influence the physical and psychological well-being of women is an underlying theme. (F,W,Y)  
Restriction(s):  
Cannot enroll if Class is Freshman

WGST 337  Women Musicians/West Mus Hist  3 Credit Hours  
Through a historical survey of female musicians from the Middle Ages to the present day, this course takes a critical look at theories of creativity and professionalism as they relate to female musical production. The course deals with women in European “art music” traditions and also in jazz and popular music. Social and cultural norms dictating appropriate female involvement with music are examined. The historical approach will serve to reveal ways in which terms such as professionalism and virtuosity have continually shifted and changed in reference to female musical performance. The course challenges students to re-think many of the commonly accepted gender-based descriptions of particular genres and elements of music through listening and musical analysis.  
Prerequisite(s):  
MHS 100 or MHS 120 or MHS 130 or MTHY 100 or WGST 275 or PSYC 275 or HUM 275 or SOC 275 or ANTH 275 or WGST 303 or ANTH 303 or SOC 303 or PSYC 303 or HUM 303 or WST 275  
Restriction(s):  
Cannot enroll if Class is Freshman

WGST 338  Women & Islam Mid East to 1900  3 Credit Hours  
This course covers the historical development of Islam’s normative stance towards women and gender roles in the Middle East from the rise of Islam to the earliest stirrings of feminist activism.

WGST 3385  Sex, War, and Violence  3 Credit Hours  
This course centers the often overlooked role of gender and sexuality in the 20th century European mobilizations of state violence such as the Holocaust, Armenian Genocide, and conflicts in the former Yugoslavia. It emphasizes the clashes that occurred between gains in gender and sexual rights during the century and projects of state violence that were frequently aimed at dismantling these gains. Attention is paid to the intersection of race, class, religion and gender in the (re)construction of new gender and sexual hierarchies in conflict and post-conflict contexts in the region.

WGST 362  Women, Politics, and the Law  3 Credit Hours  
An examination of the political behavior of women in American politics. Included is an analysis of the legal and legislative demands of American women.  
Restriction(s):  
Can enroll if Level is Undergraduate  
Can enroll if College is Arts, Sciences, and Letters

WGST 3651  Women/Leadership/Social Change  3 Credit Hours  
The purpose of this seminar is to examine women’s leadership in movements for social change. We will approach this topic through the study of historical examples, drawn primarily from the twentieth-century United States, and including movements for economic justice, race relations, sexual identity, peace, gender equality, public health and social welfare. HIST 112 and WGST/ANTH/HUM/SOC/PSYC 303 recommended as prerequisites. (W)  
Restriction(s):  
Cannot enroll if Class is Freshman  
Can enroll if Level is Undergraduate

WGST 366  Sexualities, Genders, & Bodies  3 Credit Hours  
This course introduces key questions and debates in lesbian, gay, bisexual, transgender, and queer studies. Through engagement with multidisciplinary sources, students explore how sexualities, genders, and bodies are constructed and contested, how these constructions vary in diverse contexts and historical moments, and what gaps remain in our knowledge of LGBTQ lives. (YR)

WGST 370  Women in America-Hist Perspect  3 Credit Hours  
A survey of American women’s history from the colonial period to the present. Among the topics included are family roles, women’s economic status, women’s education and women in American political life.

WGST 384  Feminist Philosophy  3 Credit Hours  
Feminists working in philosophy, most notably in the 19th and 20th centuries, have altered the traditional philosophical canon by first, recovering women philosophers who were essentially erased from the history and secondly, by extending and contributing to the standard questions of philosophy. For example, one central question of philosophy; “What can we know with certainty?” has been transformed through a feminist lens and reinterpreted as “What does one’s gender, social location and cultural framework contribute to what one knows?” In this course we will look at the variety of feminist philosophical theories with a focus on epistemology, metaphysics and ethics.  
Prerequisite(s):  
PHIL 100 or WGST 275 or WGST 303 or HUM 275 or ANTH 275 or PSYC 275 or SOC 275 or WST 275 or HUM 303 or ANTH 303 or PSYC 303 or SOC 303

WGST 385  Language and Gender  3 Credit Hours  
A study of gender issues in English and American Literature. The exact topic will vary from semester to semester, but the course may feature such topics as gay and lesbian literature, feminist criticism, images of masculinity, the representation of sexual ideologies, etc. Course may be repeated for credit when specific topics differs.  
Prerequisite(s):  
ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200

WGST 387  Gender, Sex, Power Screen Studies  3 Credit Hours  
This course examines representations of gender and sexuality across multiple screens, with a particular emphasis on Hollywood, independent, and non-Western cinema. In addition, the course explores intersections of gender with race, class, and ability to further investigate power structures in contemporary screen studies. The course will engage with a range of debates in film theory and women’s and gender studies, and enable students to apply concepts and theories to specific media texts.  
Prerequisite(s):  
JASS 248 or WGST 275 or ANTH 275 or PSYC 275 or SOC 275 or WGST 303 or ANTH 303 or PSYC 303 or SOC 303 or WST 275 or HUM 240 or ENGL 240 or FILM 240 or ENGL 248 or HUM 248 or FILM 248 or JASS 240 or HUM 275 or HUM 303
WGST 388  LGBTQ Religious Experience  3 Credit Hours
This course explores intersections of religion, spirituality, and faith with sexuality and gender. Christianity and Islam receive particular attention. We also examine LGBTQ journeys within Buddhism, Hinduism, Judaism, new spiritual movements, and interfaith work. Assignments create room for students to engage faith traditions that are not covered in the course readings. The course highlights intersections at three levels of analysis: the individual or personal level (how do LGBTQ identities intersect and interact with religious freedom and practice?), the interactional or community level (how do LGBTQ people experience belonging and rejection in diverse faith communities?), and the institutional level (how do the structures of these belief systems shape the life chances of LGBTQ people in society?). (FS,AY)

WGST 390  Topics in Women's Studies  3 Credit Hours
Examination of problems and issues in selected areas in Women's and Gender Studies. Title in Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs. (YR)
Prerequisite(s): WST 275 or WGST 275 or WGST 303

WGST 393  Black Women, Rel & Spirituality  3 Credit Hours
This lecture course surveys descriptive and critical literature relevant to the religious and spiritual experience and thought of African diasporic women. Studying religiosity and spirituality among this population helps students understand this influential, culturally-constructed world view of Black women as they engage in a variety of institutions including healthcare, economic activity, the criminal justice system, politics, and social relationships. The course gives particular attention to Black feminist and Womanist literature on these topics. (AY)
Restriction(s): Cannot enroll if Class is Freshman

WGST 3955  Diversity and the Workplace  3 Credit Hours
This course will: 1) discuss gender, race, ethnicity, disability, age, sexual orientation, and appearance as aspects of diversity; 2) examine social values and practices, and organizational policies and procedures that affect or have affected the employment opportunities of underrepresented groups; 3) examine individual (e.g., prejudice, stereotypes), group (e.g., in-groups and out-groups), and organizational (e.g., climate and culture) processes that affect work place diversity and; 4) discuss “best practices” for promoting an organizational culture that values diversity, along with a diverse workforce.
Prerequisite(s): PSYC 4305 or PSYC 431 or WST 275 or WGST 275 or OB 354 or HRM 405 or WGST 303 or PSYC 276 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303 or PSYC 101

WGST 401  Images of Women in Germany  3 Credit Hours
This course will focus on the position of women in German history after WWII and up to and after the unification of East and West Germany. Particular attention will be given to the gendered history of working through the National Socialist past, the division and reconstruction of the two nation-states, and the terrorism in West Germany in the 1970's. Students will examine images of women in films and tie them to the ideologies of gender and status of women in these larger issues of German history. Course readings will be in English. Students wishing to receive German credit for the course must enroll concurrently in GER 380: Praktikum. Students cannot receive credit for both WGST 401 and WGST 501.
Restriction(s): Can enroll if Class is Sophomore or Junior or Senior

WGST 404  Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic and political in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a "natural order," obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors and ideologies that maintain discrimination and the unequal distribution of power and resources. Student will not receive credit for both WGST 404 and WGST 504.
Restriction(s): Can enroll if Level is Undergraduate

WGST 405  Gender Roles  3 Credit Hours
This course will investigate the development of sex roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of sex roles upon male-female relationships within our society and the possibility of transcending sociological sex roles in alternate modes of living. Students cannot receive credit for both WGST 405 and WGST 505.
Prerequisite(s): PSYC 171 or SOC 200 or SOC 201 or PSYC 170 or PSYC 101

WGST 406  Culture and Sexuality  3 Credit Hours
The study of women, men, children, socialization practices and the genesis of sex roles cross-culturally. Students cannot receive credit for both WGST 406 and WGST 406.
Prerequisite(s): ANTH 101 or WGST 275 or WST 275 or WGST 303 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or PSYC 303 or SOC 303 or ANTH 303

WGST 408  Sex, Gender and the Body  3 Credit Hours
This course provides an overview of gender issues in development in the global South, including the differential effects of development policies on women and men, and the role of social movements in transforming development policy frameworks. Students may not receive credit for both WGST 408 and 508. For graduate credit, students should elect WGST 508.
Prerequisite(s): WGST 303 or ANTH 303 or HUM 303 or PSYC 303 or SOC 303

Restriction(s): Can enroll if Class is Junior or Senior

WGST 409  Feminist Theories  3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women's and men's lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality, gender, law and citizenship; women and work; and the history and politics of social movements. Students will not receive credit for both WGST 409 and WGST 509. (AY)
Prerequisite(s): WGST 275 or WST 275 or SOC 200 or SOC 201 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
WGST 412 Men and Masculinity 3 Credit Hours
This course addresses the question, "What is a man?" in various historical, cross-cultural and contemporary contexts. A major focus is on the social and cultural factors that underlie and shape conceptions of manhood and masculinity in America as well as in a variety of societies around the globe.
Prerequisite(s): SOC 200 or SOC 201 or ANTH 101 or WST 275 or WGST 275 or PSYC 202 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate

WGST 416 Earl Mod Jpn Paint&Wood Prnts 3 Credit Hours
Painting and woodblock prints of the Edo/Tokugawa (1600-1868) and Meiji (1868-1912) periods are considered in light of competing developments that on the one hand looked to Japan's classical tradition and on the other to the influence of art and artists from China and from the West. Special attention is given to female artists and images of women. Students cannot receive credit for both WGST 416 and WGST 516.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103
Restriction(s):
Can enroll if Level is Undergraduate

WGST 420 Kinship and Marriage 3 Credit Hours
A study of the diversity of kinship and marriage systems, and of the history of kinship theory which has played a seminal role in the development of general anthropological history. Students cannot receive credit for both WGST 420 and WGST 520.
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Level is Undergraduate

WGST 425 Women in Classical Antiquity 3 Credit Hours
This course examines the evidence for the lives of women in Greek, Etruscan and Roman Antiquity, from the Bronze Age through the Imperial Period. Special emphasis will be placed on the archaeological evidence, especially works of art which illustrate women's lives and their relationships with men. Documents such as dedicatory and funerary inscriptions, the poetry of Sappho and Sulpicia, and selections from the writings of Homer, Hesiod, Aristotle, Pliny, Juvenal, and other ancient authors, will also be examined critically, particularly in relationship to the works of art.
Prerequisite(s): ARTH 101
Restriction(s):
Can enroll if Level is Undergraduate

WGST 433 Writing Women in Renaissance 3 Credit Hours
This course will be taught in English, and will focus on the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Asio. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe and Marguerite de Navarre. At issue will be women's roles and women's images in city and court culture during the early modern period and the interaction of their writings with the literary canons of Italy and France.
Restriction(s):
Cannot enroll if Class is Graduate

WGST 436 Reproductive Health Policy 3 Credit Hours
This course provides a comprehensive introduction to the field of reproductive health in the US. Understanding women's reproductive health requires consideration of the intersections of gender, race, class, culture, geography, economic status, and nation within a sociopolitical context. The course introduces students to the historical trends in the regulation of women's fertility and reproductive health. Readings draw from a number of different disciplines, including: law, medical studies, history, social sciences, and personal narratives to critically examine the intent and impact of current standards for reproductive health policy and practice. Topics include: reproductive justice, contraception, pregnancy, reproductive control, and family leave. Course discussions include a focus on health policy and activism to affect change related to women's reproductive health, all within a framework of reproductive justice. A major emphasis is on developing critical thinking skills that can be applied to issues of women's reproductive health in order to educate and empower students to become proactive healthcare consumers.
Prerequisite(s): SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303

WGST 445 20C/21C Women Authors 3 Credit Hours
An analysis of images and problems of women as defined by significant British and American women writers of the 20th and 21st centuries. Style and narrative technique will also be closely examined. Students cannot receive credit for both WGST 445 and WGST 545.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Level is Undergraduate

WGST 446 Marriage and Family Problems 3 Credit Hours
Sociological analysis of problems encountered within the institution of marriage with particular reference to such issues as choosing a marriage partner, sexual adjustment, occupational involvement, conflict resolution, child rearing, divorce and readjustment. Students cannot receive credit for both WGST 446 and WGST 546.
Prerequisite(s): SOC 200 or SOC 201 or WGST 275 or WST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

WGST 447 Family Violence 3 Credit Hours
Sociological analyses of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Students cannot receive credit for both WGST 447 and WGST 547.
Prerequisite(s): SOC 200 or SOC 201 or SOC 301 or SOC 443 or PSYC 405 or WST 405
Restriction(s):
Can enroll if Level is Undergraduate

WGST 4505 Feminism & Mod. Mid. East 3 Credit Hours
This course provides an analysis of the history, historiography, and sources for the study of feminism in the Middle East since 1800.
Prerequisite(s): COMP 106 or HIST 101 or HIST 113 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
WGST 451 Family, Sexuality, Rights 3 Credit Hours
Full Course Title: Family, Sexuality, and Human Rights in a Changing World. This course investigates the changing possibilities for forming families and expressing sexuality, with a focus on how nation states and legal and cultural systems construct and respond to these changes. Selected topics include the meanings of sex, love, marriage, and relatedness in different historical moments; struggles for recognition of varied kinship and family arrangements, such as interracial, interfaith, same-sex, polygamous and multi-partner relationships; and new technologies and their implications for family life. (YR)
Prerequisite(s): (WGST 303 or SOC 303 or ANTH 303 or PSYC 303 or HUM 303) or (SOC 200 or SOC 201) or (ANTH 101 or ANTH 202)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

WGST 455 Gender and Media Studies 3 Credit Hours
The course will focus on several feminist approaches used in understanding the media and attempting to create social change through the media. The role of media in the definition and reproduction of gender-based hierarchies and in the renegotiation of gender boundaries will both be explored. To this end, both mainstream and women's media will be examined. The course will take a multicultural and international perspective, incorporating concerns of class, race, ethnicity and nation as these intersect with the study of gender and media. Mainstream and alternative media will be analyzed through readings, films, case studies, in-class collaborative exercises and longer-term projects. News, entertainment and advertising genres will be examined in a variety of media, such as the printed press, television, video, film and the Internet.
Prerequisite(s): WGST 303 or HUM 303 or ANTH 303 or PSYC 303 or SOC 303 or WGST 275 or HUM 275 or ANTH 275 or PSYC 275 or SOC 275 or WST 275
Restriction(s):
Can enroll if Level is Undergraduate

WGST 4555 Immigrant Cultures and Gender 3 Credit Hours
The history and culture of immigration since 1850, including: (1) formation and perseverance of immigrant communities and interethnic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles. Prerequisite and junior or senior standing. Students may not receive credit for both WGST 4555 and WGST 5555. For graduate credit take WGST 5555.
Prerequisite(s): ANTH 101 or WGST 275 or WST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 330 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Can enroll if Level is Undergraduate

WGST 461 Cops & Cons: Women in Prison 3 Credit Hours
Course uses contemporary theories of gendered organizations to frame analyses of prison policies and practices in employment and incarceration as they reflect and reproduce gender inequalities. Analyses will be framed within a restorative justice model, that is, a critique of the current criminal justice system of retributive justice and a paradigm of what a alternative system could be.
Prerequisite(s): PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303 or SOC 200 or SOC 201 or CRJ 240 or CRJ 300
Restriction(s):
Can enroll if Class is Junior or Senior

WGST 4650 Sem in US Women's History 3 Credit Hours
Seminar on the historiography and key primary sources related to U.S. Women's History. The course covers examples of classic texts in the field as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the field, its guiding concepts, foundational texts, newest trajectories, and impact on the field of history as a whole. The graduate version of this course includes weightier readings and assignments.
Prerequisite(s): HIST 300
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

WGST 466 Arguing Feminism: Rhetoric 3 Credit Hours
An introduction to the work of major twentieth century feminists working in rhetoric and related fields. Students examine recurring themes of language, meaning, ethics and ideology, and practice writing strategies which address rhetorical and ethical concerns central to feminist/ academic writing.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

WGST 470 Black Women / Lit, Film, Music 3 Credit Hours
This course will examine works produced by Black women authors, activists, filmmakers and musical performers in order to determine the methods they have incorporated in order to challenge and eradicate the prevailing stereotypes about Black women while advancing their own personal and racial agendas. It will also focus on the extent to which race, gender and class have shaped the creative work of Black women. Students will be required to read, analyze and write their own responses to the works of such firebrands as author Zora Neale Hurston, activist Ida B. Wells, filmmaker Julie Dash and singer Billie Holiday.
Prerequisite(s): FILM 240 or FILM 248 or FILM 385 or AAAS 239 or AAAS 275 or HUM 303 or HUM 221 or HUM 222 or HUM 223 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 237 or ENGL 239 or ENGL 248 or ENGL 200 or ANTH 303 or PSYC 303 or SOC 303 or WGST 303
Restriction(s):
Can enroll if Program is AB-Women's and Gender Studies

WGST 471 LGBTQ Literature 3 Credit Hours
This course surveys primarily contemporary literature by writers who identify as gay, lesbian, bi-sexual, transgender, or queer. By studying the self-representation and culturally unique perspective of this emerging canon of writers, students in this course understand the emergence of LGBTQ literary traditions and understand the cultural diversity within these traditions. Students learn to identify the aesthetic qualities (such as camp, performativity, coded subtexts, homoeroticism, and the relationship between creativity and sexuality), and historical, political, and social concerns that characterize LGBTQ literary and cultural production. Topics covered include the struggle for civil rights before and after Stonewall, coming out narratives, the negotiation of homophobic cultures, post-colonial writers, and memoirs of the LGBTQ experience, as well as the historical emergence of sexual categories and the literary critique of heteronormativity. This course counts toward the English discipline diversity requirement. Students cannot receive credit for WGST 471 and WGST/ ENGL 571.
Prerequisite(s): (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239) and (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40)
WGST 473 Arab American Women Writers 3 Credit Hours
This course examines the literary and cultural contributions of Arab and Arab American women novelists, poets, filmmakers and artists to the development and consolidation of cultures of understanding and coexistence, explores the relations between, among others, citizenship and belonging, race and national security, gender and geographical mobility, and ethnic minorities and mainstream consciousness; stresses how literary and artistic productions of Arab and Arab American women writers and artists fosters alternative visions of socio-cultural coexistence, dialogue, and hospitality by means of technical and stylistic experimental and renovation.
Restriction(s):
Cannot enroll if Class is Freshman

WGST 475 Soc Construct Mental Illness 3 Credit Hours
Diversity Issues in Mental Health explores varied cultural descriptions and models of mental illness. By focusing on the ways that culture shapes how people experience, and respond to, mental illness this class explores cultural representations of mental illness, ranging from discrete illness resulting from a chemical imbalance to a profound threat to order. We seek to understand the cultural, personal, and political underpinnings of mental illness and medical practices in societies throughout the world. The course utilizes an interdisciplinary perspective, drawing from multiple sources of information regarding mental health issues, including feminism, psychiatry, history, sociology, and literature. Issues raised throughout the course include the ways gender, race, culture, religion, and stigma influence the diagnosis of mental illness, patterns of help-seeking behavior, formation of comprehensive mental health policy, and treatment options.
Prerequisite(s): SOC 200 or SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303

WGST 476 Inside Out Prison Exchange 4 Credit Hours
This community-based course, taught in a local correctional facility, brings university students and incarcerated students together to study as peers. Together students explore issues of crime and justice, drawing on one another to create a deeper understanding of how these issues affect our lives as individuals and as a society. The course creates a dynamic partnership between UMD and a correctional facility to allow students to question approaches to issues of crime and justice in order to build a safer and more just society for all. The course encourages outside (UMD) students to contextualize and to think deeply about what they have learned about crime and criminals and to help them pursue the work of creating a restorative criminal justice system; it challenges inside students to place their life experiences into larger social contexts and to rekindle their intellectual self-confidence and interest in further education.
Restriction(s):
Cannot enroll if Class is Junior or Senior

WGST 478 Women and Gen Studies Intern 3 Credit Hours
Provides field experience in social welfare or criminal justice agencies e.g., for children/adolescents in residential programs, in abuse remediation, in probation, for chemical dependencies, in victim advocacy, for the elderly, in prisons, for special needs populations, in services, in medical/public health, in police services, and for families and communities. Supervision by approved field instructors. An internship of 80 hours is required for three (3) credits. Instructor and student will work together to determine appropriate intern placement. Approval of instructor and the Women's Studies Director is required.
Prerequisite(s): ANTH 275 or SOC 275 or WST 275 or PSYC 275 or HUM 275 or WGST 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

WGST 481 Gender and Globalization 3 Credit Hours
Mass media, politics and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create.
Prerequisite(s): HUM 303 or PSYC 303 or SOC 303 or WGST 303
Restriction(s):
Can enroll if Level is Undergraduate

WGST 484 Violence Against Women 3 Credit Hours
Course examines local and global social violence against women outside family and other intimate relationships. Students consider violations against women's human rights through the life cycle, which are often sanctioned under the guise of cultural practices and misinterpretations of religious tenets. Topics include sex-selective abortion and female infanticide (the "missing millions"), female genital mutilation and cosmetic surgeries; prostitution and pornography; trafficking in women; sexual harassment; and women's experiences of war as soldiers, non-combatants and refugees. Topics are "paired", that is, students compare understandings of Western and non-Western social practices related to gender. Students examine both institutionalized sexism and racism, as part of political, economic, and social systems, and sexism and racism as realities affecting individual women's lives.
Prerequisite(s): SOC 200 or SOC 201 or WGST 303 or HUM 303 or PSYC 303 or ANTH 303 or SOC 303 or WGST 275 or HUM 275 or PSYC 275 or SOC 275 or ANTH 275 or WGST 275
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

WGST 486 Queer Theory & Literature 3 Credit Hours
This course reads theories of sexuality to analyze how writers since 1600 have imagined printed text to reflect and shape desire, particularly same-sex desire. The course questions how same-sex desire appears in literature written before the theorization of "the Homosexual" in the late nineteenth century as well as how writers imagine sexuality before a hetero/homosexual binary appears. Writers may include contemporary theorists (Sedgwick, Foucault, Butler) as well as novelists (Gaskell and Stoker), playwrights (Kushner and Wycherley), and poets.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or AAAS 239)

WGST 487 Monsters, Women & the Gothic 3 Credit Hours
This course questions our inheritance of the "the gothic" as a district literary style that continues to discipline readers? notions of gender and sexual identity. The course argues that by tracing the gothic's literary history, we may simultaneously witness a history of gender formation. Readings may include English novelists who originated a gothic style in the late sixteenth century as well as how writers imagine sexuality before a hetero/homosexual binary appears. Writers may include contemporary theorists (Sedgwick, Foucault, Butler) as well as novelists (Gaskell and Stoker), playwrights (Kushner and Wycherley), and poets.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Certificate Requirements

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<tr>
<th>Code</th>
<th>Title</th>
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<td>Topics in Women's Studies</td>
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<td>ENGL 323</td>
<td>Advanced Creative Writing</td>
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<td>COMP/ENGL 468</td>
<td>Read/Writ Young Adult Fiction</td>
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<td>ENGL/COMP 310</td>
<td>Narrative Journalism</td>
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<td>JASS 310</td>
<td>Narrative Journalism</td>
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<td>JASS 315</td>
<td>Media Product for Metro Comm</td>
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<td>JASS 330</td>
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<td>JASS 436</td>
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<td>JASS 467</td>
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<td>COMP/COMM/</td>
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<tr>
<td>WGST 466</td>
<td>Research Writing</td>
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Notes Regarding Writing Certificate Program:

1. Students, at the time that they are completing the Writing Certificate, must submit a Memorandum of Reflection, a sample of written work, and a Writing Certificate Completion Sheet. See LCC Department for details.
2. Courses used toward another major, minor or certificate program may simultaneously count toward the Writing Certificate.
3. A minimum 3.0 GPA in the courses counting toward the Writing Certificate and a minimum 2.0 cumulative GPA are required at the time of graduation and/or posting of the certificate.

College of Business

Vision and Mission

The vision of the University of Michigan-Dearborn's College of Business is to build on the quality tradition of the Block M by being a thoughtful leader, known for creating positive impact on the communities we serve, and for promoting a global perspective through active learning, relevant teaching, and influential research.

The mission of the University of Michigan-Dearborn's College of Business is to offer a challenging and engaging business education that broadens our students' intellectual perspectives and career opportunities in an inclusive environment through a balanced emphasis on active learning, rigorous and relevant teaching, and research. Our mission is supported by:
A faculty committed to teaching that supports student development and preparation for a wide range of business opportunities.

Collaborative research that has sustained impact on the thoughts and activities of our academic and professional colleagues.

Service by faculty and staff that supports an evolving curriculum and the needs of our students, personnel, community, and external partners.

Since 1959, the College of Business at the University of Michigan-Dearborn has been committed to providing practice-oriented business programs that address the needs of business, industry, and government. Our undergraduate and graduate students are taught by faculty who have close ties with the business community as well as expertise from participating in the business, professional, and academic realms.

The exceptional performance of our faculty has provided that the College of Business is one of 856 schools worldwide to be accredited by AACSB International. This accreditation not only speaks to the quality of the faculty but also to the relevancy and practical nature of the courses offered in the College.

When students graduate from the College of Business, they take with them the skills and knowledge to lead in a rapidly-changing business environment, both regionally and nationally. Whether it is through their participation in our internship program or their experiences in iLabs, the College’s Center for Innovation Research, our students gain real experience and are positioned to immediately contribute to their employers’ success and advance their career.

### Bachelor of Business Administration Program

The Bachelor of Business Administration (BBA) program is a professionally oriented program that develops the diversified competencies called for in the management of a modern business enterprise. The program also is designed to impart the relevant knowledge, competencies, and skills demanded to manage and lead modern public and private organizations. It also provides a rigorous preparation for graduate study in business administration, law, and related areas.

### BBA Program Learning Goals

The following Learning Goals have been developed by the faculty in the College of Business. These goals describe what we want all of our students to know and be able to accomplish upon graduation.

1. Students will be knowledgeable about the business disciplines.
2. Students will be effective communicators.
3. Students will be effective team members.
4. Students will be competent in the application of technology.
5. Students are able to understand and integrate knowledge across diverse disciplines, cultures, and context.
6. Students will be knowledgeable about ethical principles and their application.
7. Students will apply critical thinking skills to business situations.

### BBA Program Planning for UM-Dearborn Pre-business Students

Programs of undergraduate study in business administration leading to a bachelor’s degree involve approximately four years of college study, the first two years of which can be considered pre-professional preparation in foundation courses covering fundamental subject matter. The third and fourth years constitute the more specialized professional phase of the degree program. It is in the offering of this professional phase that the faculty of the College of Business has principal responsibility.

Students seeking the BBA degree who are admitted to UM-Dearborn as freshmen enter the pre-business program of the College of Business. The pre-business program is designed to provide students with a liberal arts foundation. Pre-business students declare their major in the BBA program during the term in which they complete their sophomore year and the specific course requirements. Students not enrolled in the BBA program cannot elect more than 30 credit hours in coursework offered by the College of Business.

### Admission

Admission to the BBA program is competitive and requires that the student has high promise as evidenced by the record compiled in the first two years of study. A student must have completed at least 55 credit hours to be considered for admission to the BBA program. These credit hours must include necessary prerequisites for admission to the BBA program.

Courses required for admission to the BBA Program, including those courses that are prerequisite to the required courses, in which a grade of C- or below has been received, must be repeated during the student's next academic term. Prerequisite courses are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105 &amp; COMP 280</td>
<td>Writing &amp; Rhetoric I and Business Writing &amp; Rhetoric</td>
<td>6</td>
</tr>
<tr>
<td>ECON 201 &amp; ECON 202</td>
<td>Prin: Macroeconomics and Prin: Microeconomics</td>
<td>6</td>
</tr>
<tr>
<td>MATH 104 or MATH 105</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>BA 100</td>
<td>College of Business Foundation</td>
<td>1</td>
</tr>
<tr>
<td>ISM 120</td>
<td>Bus Prob Solving w/ Comp Apps</td>
<td>3</td>
</tr>
<tr>
<td>ACC 298 &amp; ACC 299</td>
<td>Financial Accounting and Managerial Accounting</td>
<td>6</td>
</tr>
<tr>
<td>DS 301</td>
<td>Intro Business Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, students must complete a minimum of 9 credits from the BBA core and/or any additional upper-level business courses.  

| Total Credit Hours | 38 |

Minimum 2.80 GPA including DS 301.

Appropriate and timely sequencing of the required math courses is critical for the successful admission to the BBA program. Students, entering as freshmen, are required to have completed math through college algebra or pre-calculus (MATH 104 or MATH 105) by the end of their sophomore year. Freshmen are required to take the math placement exam prior to their first term of enrollment and begin their math courses in their first term of enrollment.

### BBA Program Planning for Transfer Students

Programs of undergraduate study in business administration leading to a bachelor’s degree involve approximately four years of college study, the first two years of which can be considered pre-professional preparation in
foundation courses covering fundamental subject matter. The third and fourth years constitute the more specialized professional phase of the degree program. It is in the offering of this professional phase that the faculty of the College of Business has principal responsibility.

**Admission**

A transfer student seeking the BBA degree enters the College of Business as a Pre-business student. The transfer student will complete required courses for admission to the BBA Program. Prerequisite courses are UM-Dearborn’s:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105 &amp; COMP 280</td>
<td>Writing &amp; Rhetoric I and Business Writing &amp; Rhetoric</td>
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</tr>
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<td>MATH 104 or MATH 105</td>
<td>College Algebra &amp; Pre-Calculus</td>
<td>4</td>
</tr>
<tr>
<td>BA 100</td>
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<td>1</td>
</tr>
<tr>
<td>ISM 120</td>
<td>Bus Prob Solving w/ Comp Apps</td>
<td>3</td>
</tr>
<tr>
<td>ACC 298 &amp; ACC 299</td>
<td>Financial Accounting &amp; Managerial Accounting</td>
<td>6</td>
</tr>
<tr>
<td>DS 301</td>
<td>Intro Business Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, students must complete a minimum of 9 credits from the BBA core and/or any additional upper-level business courses.  

Total Credit Hours: 38

---

1 Minimum GPA of 2.80 including DS 301.

The UM-Dearborn Undergraduate Admissions Office provides local community colleges with equivalency tables. These tables should be consulted when planning course scheduling. Transfer students with credit for DS 301 from an AASCB accredited school will be required to complete BE 401 or FIN 401 as part of the 12 credits of upper-level business credits for admission to the BBA Program.

Admission is based on the quality and content of both the high school and the college academic records, and standards of evaluation are designed to ensure that each student who is admitted has the intellectual capacity and the preparation to pursue advanced undergraduate work successfully. Admission criteria are applied to all students without regard to race, color, sex, creed or national origin.

Students who plan to transfer to the BBA program at UM-Dearborn after completing two academic years of course work should plan to complete most of the General Education requirements (Dearborn Discovery Core) prior to transfer. Please refer to the University’s website at: umdearborn.edu/faculty-staff/academic-program-and-course-development/dearborn-discovery-core-general-education for complete information regarding general education requirements.

Appropriate and timely sequencing of the required math courses is critical for the successful admission to the BBA program. Pre-business students are encouraged to take the math placement exam prior to their first term of enrollment. Transfer students must progress with math every full term of their enrollment until they complete the math requirement.

**Transfer of Credit**

Full credit will be given for all acceptable courses in which a student has earned at least a C grade at an accredited college. A maximum of 62 credits from a community college and a maximum of 75 credits from a non-UM university or college may be applicable towards degree requirements; the total maximum number of non-UM credits applied not to exceed 75. A maximum of 90 applicable credits from another UM unit may be applicable towards degree requirements. The minimum number of hours at UM and in the College of Business as stated in the section on BBA Degree Requirements must also be earned.

**Michigan Transfer Agreement (MTA)**

Refer to this topic under Admissions in the General Information section of this Catalog.

**Articulation Agreements**

The College of Business has articulation agreements with Henry Ford College, Macomb Community College, Oakland Community College, and Schoolcraft College. Please refer to the University’s website at: https://umdearborn.edu/cob/undergraduate-programs/admission/transfer-students/community-college-transfers for information.

**BBA Degree Requirements**

The BBA degree will be granted to those students who meet the following requirements:

Satisfactory completion of at least 120 hours of college-level work distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBA Prerequisite requirements</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Dearborn Discovery Core requirements</td>
<td>13-46</td>
<td></td>
</tr>
<tr>
<td>Critical Thinking requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BBA Core requirements</td>
<td>37-38</td>
<td></td>
</tr>
<tr>
<td>Major requirements</td>
<td>18-21</td>
<td></td>
</tr>
</tbody>
</table>

1 Transfer students may fulfill the general education requirements with the Dearborn Discovery Core or in part with the completion of the Michigan Transfer Agreement (MTA). Please contact an advisor for information.

Electives to meet the minimum 120 credits for graduation will vary student to student. Courses may count for more than one area requirement. Satisfactory completion of 48-58 hours at UM-Dearborn. A student may elect no more than the equivalent of two courses within their last 36 credits at another higher education institution. A minimum of 30 credits must be completed as a student in the BBA Program.

Achievement of a minimum 2.0 grade point in all UM-Dearborn coursework, in all courses offered by the College of Business, and in the major.

**BBA Prerequisite Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 100</td>
<td>College of Business Foundation</td>
<td>1</td>
</tr>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
</tbody>
</table>
ACC 299 Managerial Accounting 3
ISM 120 Bus Prob Solving w/ Comp Apps 3
COMP 105 Writing & Rhetoric I 3
COMP 280 Business Writing & Rhetoric 3
ECON 201 Prin: Macroeconomics 3
ECON 202 Prin: Microeconomics 3
MATH 104 College Algebra 4
or MATH 105 Pre-Calculus

DS 301 Intro Business Statistics 3

In addition, students must complete a minimum of 9 credits from the BBA core and/or any additional upper-level business courses. 1

Total Credit Hours 38

1 Minimum GPA of 2.80 including DS 301.

Note: Each incoming student will take the UM-Dearborn Composition Placement Examination. Freshman must take the exam and enroll in the appropriate level of English Composition in their first term of enrollment. Transfer students must take the exam by the sixth week of the first semester in the College of Business. Performance on the exam will determine which writing courses will be required. Excellent performance on the examination may result in the requirement for COMP 105 and/or COMP 106/COMP 280 being waived. Note that demonstrating proficiency does not grant credit for courses not taken.

Note: All incoming freshmen will take the UM-Dearborn Mathematics Placement Exam and enroll in the appropriate level of math their first term of enrollment. Transfer students without credit for college algebra or pre-calculus or higher level math are required to take the exam by the sixth week of their first semester and begin math, based on their placement, by their second semester of enrollment. Excellent performance on the examination may result in the requirement for MATH 104/MATH 105 being waived. Note that demonstrating proficiency does not grant credit for courses not taken.

Dearborn Discovery Core – General Education Requirements (13-46 hrs)

Courses that satisfy the Dearborn Discovery Core may also apply towards specific BBA requirements. Please refer to the General Information section of this Catalog for requirements.

Critical Thinking Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 233</td>
<td>Critical Thinking</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 3

Business Administration Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 300</td>
<td>Career Planning &amp; Develop</td>
<td>1</td>
</tr>
<tr>
<td>BA 320</td>
<td>Proj Mgmt &amp; Leadership Skills</td>
<td>3</td>
</tr>
<tr>
<td>BA 330</td>
<td>Managerial Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 400</td>
<td>Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 451</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 302</td>
<td>Advanced Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 380</td>
<td>Accounting Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>&amp; ACC 381</td>
<td>and Accounting Info Sys Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 37-38

1 ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

Major Requirements (18-21 hrs)

All BBA students must declare and fulfill the requirements for a major in Accounting, Digital Marketing, Finance, General Business, Human Resource Management, Information Systems Management, Marketing, Small Business Management, or Supply Chain Management.

Note: Only one independent study can be applied toward the General Business, Marketing, and Human Resource Management majors. Marketing majors may do more than one if they are iLabs related.

Minor

Students pursuing any degree may wish to complement their academic program with a minor from the College of Business. Courses cannot apply towards both a major and a minor.

BBA Elective Courses

Students must complete a minimum of 120 credits to earn the BBA degree. Elective credits are the non-specific credits each students needs to reach degree completion. College-level courses in any discipline which bear UM-Dearborn or transferable academic credit can apply. College of Business internships (BI 350, etc.) may also apply. Additive credit courses do not carry college-level credit toward program. Courses below the 100 level are additive credit. Non-business co-ops and their related seminars do not carry credit toward a BBA degree.

Majors

• Accounting (p. 507)
• Business Studies as a Secondary Major (p. 510)
• Digital Marketing (p. 512)
• Finance (p. 514)
• General Business (p. 518)
• Human Resource Management (p. 519)
• Information Systems Management (p. 521)
• Marketing (p. 525)
• Small Business Management (p. 528)
• Supply Chain Management (p. 529)

Minors

• Accounting (p. 507)
• Digital Marketing (p. 512)
• Entrepreneurship (p. 513)
• Finance (p. 514)
• Financial Planning (p. 514)
• Human Resource Management (p. 519)
• Information Systems Management (p. 521)
• Information Systems Security (p. 525)
• Management (p. 525)
• Marketing (p. 525)
• Supply Chain Management (p. 529)

Certificates
• Entrepreneurship (p. 513)
• Financial Planning (p. 518)

Administration
N. Raju Balakrishnan, PhD, Dean
Karen S. Strandholm, PhD, Associate Dean
Tim Davis, MBA, Assistant Dean

Chairs and Directors
Michael Kamen, Academic Program Director, Graduate Programs
Lee Redding, Chair, Associate Professor, Accounting and Finance
Crystal Scott, Chair, Associate Professor, Management Studies
Susan Wells, Academic Program Director, Undergraduate Programs

Professors Emeriti
Bayou, Mohamed E., PhD, Professor Emeritus of Accounting
Iatz Jr., Robert, JD, LLM, Professor Emeritus of Taxation
Bublitz, Bruce, PhD, Professor Emeritus of Accounting
Callahan, Thomas J., PhD, Associate Professor Emeritus of Organizational Behavior
Chou, Yu-Min, PhD, Professor Emeritus of Business Economics and Finance
Cowan, Ross D., MF, Associate Professor Emeritus of Operations Management
Foran, Michael, PhD, Professor Emeritus of Accounting
Fricke, Cedric V., PhD, Professor Emeritus of Business Administration
Lev, Benjamin, PhD, Professor Emeritus of Operations Research
Lyons, Thomas F., PhD, Professor Emeritus of Business Administration
Martin, William R.D., MBA, Professor Emeritus of Business Administration
Steel, Robert, PhD, Professor Emeritus of Organizational Behavior
Streeter, Victor J., PhD, Associate Professor Emeritus of Management Information Systems
Waissi, Gary, PhD, Professor Emeritus of Operations Research

Faculty

Department of Accounting and Finance
Baker, Susan, MBA, University of Michigan, Lecturer
Broman, Amy, PhD, JD, University of Michigan, Lecturer
Cai, Kelly N., PhD, University of Houston, Professor
Graybeal, Patty, PhD, Virginia Tech University, Lecturer
Green, Brian P., PhD, CPA, Kent State University, Professor
Hayes, Matthew, PhD, Arizona State University, Assistant Professor
Jin, Shunyao (Cynthia), PhD, Michigan State University, Assistant Professor
Kent, Richard, PhD, University of Queensland, Assistant Professor
Killey, Michael N., PhD, Florida Atlantic University, Assistant Professor
Kobelsky, Kevin, PhD, University of California, Associate Professor
Kocher, Claudia, PhD, Michigan State University, Associate Professor
Lee, Hei Wai, PhD, University of Illinois at Urbana-Champaign, Professor
Miranda, Maria (Mercedes), PhD, University of New Orleans, Lecturer
Philpich, Kirk, DBA, Indiana University, Associate Professor
Redding, Lee, PhD, Princeton University, Associate Professor
Singh, Vivek, PhD, Virginia Technological University, Professor
Valero, Magali, PhD, Arizona State University, Associate Professor
Vlisides, Nicholas, MBA, Wayne State University, Lecturer
Xie, Alice, PhD, Syracuse University, Associate Professor

Department of Management Studies
Ahuvia, Aaron, PhD, Northwestern University, Professor
Ames, Justin, PhD, Case Western Reserve University, Assistant Professor
Balakrishnan, N. Raju, PhD, Purdue University, Professor
Beatty, Joy, PhD, Boston College, Associate Professor
Cao, Yinyin, PhD, University of Pittsburgh, Assistant Professor
Chandra, Charu, PhD, Arizona State University, Professor
Chen, Yi-Su, PhD, Boston College, Associate Professor
Deska, Thomas, MA, Michigan State University, Lecturer
Fischer, Christine, MA, Eastern Michigan University, Lecturer
Freeman, Lee, PhD, Indiana University, Associate Professor
Fu, Wayne, PhD, Georgia Institute of Technology, Assistant Professor
Guo, Yi (Maggie), PhD, Texas A M, Associate Professor
Harris, Marcus, DBA, Lawrence Technological University, Lecturer
Hartge, Timothy, MA, University of Michigan, Lecturer
He, Jun, PhD, University of Pittsburgh, Associate Professor
Holowicki, Gerald, MS, Eastern Michigan University, Lecturer
Izberk-Bilgin, Elif, PhD, University of Illinois at Chicago, Associate Professor
Kao, Ta-Wei (Daniel), PhD, State University of New York at Buffalo, Assistant Professor
Kaufman, David, PhD, University of Michigan, Assistant Professor
Keyes, Patrick, MBA, Central Michigan University, Lecturer
Klein, Barbara D., PhD, University of Minnesota, Professor
Kumar, Kamlesh, PhD, University of North Texas, Professor
Lee, Cindy, MS, University of Virginia, Lecturer
Lee, Junghyun (Jessie), PhD, George Washington University, Associate Professor
Lei, Kyungwon, PhD, Rutgers University, Assistant Professor
Liu, Zhixin (Jason), PhD, Ohio State University, Associate Professor
Majeske, Katherine, MBA, University of Michigan, Lecturer
Molloy, Janice, PhD, Ohio State University, Associate Professor
Ro, Young, PhD, University of Michigan, Professor
Samfilippo, Chris, MBA, Wayne State University, Lecturer
Scott, Crystal, PhD, Pennsylvania State University, Associate Professor
Smrt, Diana, PhD, Southern Illinois University, Lecturer
Internship & Career Management Center (ICMC)

Building a career and building a business are actually quite similar.

To build a business you must identify an unmet need, develop a plan to serve that need, develop a strategy to market your product or service and lastly, ensure that your customer is satisfied. To build a career you must identify where there is an opportunity, develop a personal plan to be able to respond to that opportunity, develop a plan to market yourself and lastly, ensure that you are providing value to the market. We help our students develop a viable career plan that will serve them and their employers in the short term as well as throughout their careers. We are looking forward to working with you and remember, the ICMC - Works4U!

Take Control of your Career!

We help students develop a personal career strategy that helps them:

- Apply the skills and knowledge developed in the classroom
- Continue to build a strong track record of experiences
- Successfully network with other business professionals and executives

Career Development Process

Our process starts when the student submits the ICMC interest form located on our web page. It then continues as the student learns to take advantage of the services that we provide. That may involve enrolling in BA 300 (Career Planning and Development) and/or participating in our Career Mentoring Program and/or the Internship Program, and finally culminates with the successful launch of their career upon graduation.

In addition and as part of the preliminary graduation process, we want to meet with graduating students to help determine and facilitate their post-graduation career plans. We offer career counseling, interviewing skills and salary negotiation tips.

BA 300 - Career Planning and Development

You are encouraged to register for BA 300 as soon as you are eligible. This course provides you with the fundamentals to be more successful in your career pursuits. Through many activities and personal reflection opportunities, we help students take control of their careers by:

- Helping them identify their interests and passions
- Identifying ways for them to pursue those passions
- Learning how to effectively market themselves in today’s economy

Career Mentoring

We offer a referral source for students to choose a potential mentor in their major or industry of interest. We also help students facilitate the conversations and interactions with these mentors in order to help them with the skills that they need. There is not one-way to work with a mentor, we want to help students find what works for them.

Internship Program

The College of Business Internship Program provides unparalleled opportunities for University of Michigan-Dearborn, College of Business students of all disciplines to enhance their academic experience by applying their education in actual business environments. Through an internship, students apply the skills and knowledge they have developed in the classroom, build a strong track record and enhance their relationship skills with business leaders in the community.

All COB students are eligible for an internship experience. Junior and Senior BBA students have the option of pursuing an internship for academic credit, as part of their career strategy. These students often have the option of considering internships that are either part or full time in several different industries. The vast majority of our internships are paid.

Students who participate in the program get the opportunity to:

- Apply classroom theory to actual work situations
- Test out their interests and develop their long-range career plans
- Earn elective course credits toward their degree requirements
- Enhance their marketability after graduation
- Earn money
- Develop experience and maturity by strengthening their resourcefulness, problem-solving skills, self-confidence, self-discipline, and their sense of responsibility
- Potentially gain faster promotions once they are hired, than their non-internship experienced co-workers
- Develop human relations and communication skills through interaction in career settings

For a student to participate in the internship program, the following policies are required:

- Student must sign and comply with an Internship Contract.
- Student must have at least a cumulative GPA of 2.7 in order to participate.
- During the internship, the student will be required to submit periodic updates via Canvas and submit a final paper summarizing their internship experience.
- If a Business Internship course is elected, a grade of Satisfactory or E will be recorded on your transcript once the internship has been completed.
- Internship work commitments can be for one or multiple semesters and are negotiated between the student and the employer.
- Internship Certificates are awarded to students who successfully complete six hours of COB internship credit.

Students enrolled in BI 350, BI 450, or BI 470 are considered to be full-time by the University of Michigan-Dearborn. Students enrolled in these courses must get permission from the Internship office to elect up to two additional courses while on internship.

Students enrolled in BI 355, BI 455, or BI 475 are considered to be part-time by the University of Michigan-Dearborn and are expected to manage their overall course load in a manner that is consistent with the employer’s needs and the needs of the student.

For the BBA degree, up to six internship credit hours can be applied to elective courses. Internships are available in all College of Business major disciplines.
Career Counseling
Our office is always open to help students on a one on one basis. Some students drop in for a brief conversation while others schedule a more private counseling session with someone from our staff to help them with the myriad of challenges that they may face in their personal career. Feel free to take advantage of this support whenever you need it.

Placement Support
Finally, as the student approaches their graduation date, we work closely with them to help them understand potential professional certification options, as well as employer development programs, that might help them be even more successful in their careers. We then help connect the student with firms where viable opportunities exist in the field of their choosing.

Get Started!
If you have not done so already, visit the ICMC website to let us know you are interested in working with us. Then come by for an initial counseling session, sign up for BA 300 - Career Planning and Development as soon as possible, and get ready to take advantage of the valuable processes that will help you while in school but also as you graduate and begin to launch your career.

If you have any questions, stop by our office in FCN 285 and we can help you get the ball rolling.

For additional information regarding our programs, please visit the website at: umdearborn.edu/cob/life-cob/internship-career-management-center (http://umdearborn.edu/cob/life-cob/internship-career-management-center/).

Academic Honors

Dean's List
A student is honored by inclusion in the Dean's List if he or she meets two conditions:

1. has completed at least 12 credit hours in graded coursework toward a degree during the term, and
2. has achieved a 3.50 or better term GPA. The Dean's List is compiled after the fall, winter, and summer terms.

Beta Gamma Sigma
Beta Gamma Sigma is the national honor society for business schools accredited by AACSB International. Membership in Beta Gamma Sigma is one of the highest scholastic honors that a student in the BBA program can achieve. It is based on outstanding scholastic achievement as measured by overall grade point average. Invitation for membership to Beta Gamma Sigma is extended to qualified BBA juniors and seniors in the top 5 percent of their class.

Honor Scholars
Every year, an honor scholar from each major may be selected and recognized at the Annual Honors Convocation. Selection is made by the College of Business’s Scholarship Committee based on the students’ GPA (both cumulative and major GPA) and achievement of 90 credit hours or more toward degree.

Chancellor’s Medallion
The Chancellor’s Medallion is awarded at each Commencement Exercise to UM-Dearborn graduates including one from the College of Business. The student is selected by the Scholarship Committee based on his/her quality of character, vitality, intellect, integrity and academic record. The Fall awardee is selected from students who were graduated in August and those who are to be graduated in December. The Winter awardee is selected from students who are to be graduated in April/May.

Graduation with Distinction
Students who are degree candidates in Business and have obtained a cumulative GPA of at least 3.20 but less than 3.60 are recommended for graduation "With Distinction." Such distinctions are noted on the transcript and diploma.

Graduation with High Distinction
Students who are degree candidates in Business and have obtained a cumulative GPA of at least 3.60 are recommended for graduation "With High Distinction." Such distinctions are noted on the transcript and diploma.

Accounting
The Accounting major provides the student with a foundation to pursue a career in accounting. Whether you are interested in entering the corporate world or preparing to be a CPA, we have a program flexible enough to serve your needs. Our students are challenged to recognize and define complex business problems, explore alternatives, and effectively communicate successful solutions. Students in the Accounting major at UM-Dearborn can complete the CPA exam preparation course through CPAexcel® at a significant discount, and even qualify to receive a 100% reimbursement.

Accounting 4+1 Option
The Accounting 4+1 Option allows students to earn both the BBA in Accounting and the Master of Science in Accounting at a substantial savings in time and money. Students in the program may count four graduate accounting courses toward the BBA Accounting major and the MS-Accounting at the same time, thereby saving four courses. Students will receive scholarships to reduce the net cost of these four shared courses to undergraduate tuition rates. Please see the College's website for admission requirements and program details.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Business Administration Core Requirements**

<table>
<thead>
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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BA 300</td>
<td>Career Planning &amp; Develop</td>
<td>1</td>
</tr>
<tr>
<td>BA 320</td>
<td>Proj Mgmt &amp; Leadership Skills</td>
<td>3</td>
</tr>
<tr>
<td>BA 330</td>
<td>Managerial Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 400</td>
<td>Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 451</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 302</td>
<td>Advanced Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following: 3-4

- ISM 310 | Info Systems in Management    | 3            |
- ACC 380 & ACC 381 | Accounting Information Systems and Accounting Info Sys Lab | 3 |
- LE 253 | Business Law                  | 3            |
- MKT 352 | Mktg Principles and Policies  | 3            |
- OB 354 | Behavior in Organization      | 3            |
- OM 300 | Intro to Operations Management| 3            |

Total Credit Hours: 40-41

**Accounting Minor Prerequisites**

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>MATH 104, 105</td>
<td>College Algebra, Pre-Calculus</td>
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</table>

**Minor Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 299</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 360</td>
<td>Federal Income Taxation</td>
<td>3</td>
</tr>
<tr>
<td>Plus one course from: any other ACC course at the 300 level or above.</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours: 15

Finance majors may use ACC 358 towards an accounting minor.

**ACC 298 Financial Accounting 3 Credit Hours**

The first course, of a two-course sequence, to introduce accounting concepts, principles, financial statement preparation, and the uses of accounting information. Topics include fundamental concepts and procedures of financial accounting including income measurement, asset valuation, financial statement preparation and analysis, and uses of accounting information for decision making.

**Prerequisite(s):** (MATH 104* or MATH 105* or Mathematics Placement with a score of 115 or MATH 113* or MATH 115* or Mathematics Placement with a score of 116)

**Restriction(s):**

Can enroll if Class is Sophomore or Junior or Senior or Graduate
ACC 299  Managerial Accounting  3 Credit Hours
To introduce managerial accounting concepts and applications. Specific topics include: cost terminology, cost behavior, product costing systems, budgeting, standard costing systems and variance analysis, and cost allocation methods. To connect the materials in this course to concepts covered in the prerequisite course, ACC 299 begins with financial statement analysis. Discussion of ethics and globalization issues will be interwoven into the presentation of course materials.
Prerequisite(s): ACC 298

ACC 304  Auditing & Forensic Examinations  3 Credit Hours
To study forensic examination and investigation techniques including typical embezzlement and financial statement fraud scenarios, fraud risk factors, sources and uses of evidence, and interrogation and surveillance techniques. Specifically, the course presents an introduction to forensic accounting and fraud examination by studying the nature of fraud, how it is committed, and the motivations of those who defraud an organization, owners, and capital markets. Fraud detection includes the recognition of fraud symptoms and approaches to act on those symptoms. Fraud investigation includes the examination of a fraud act, methods used to conceal the act, and other methods specific to detect various types of fraud. Other course topics may include expanding assurance services, advanced internal control testing, and risk based investigations. Special attention will be given to the changing role and services offered by internal auditors and fraud examiners, and responsibility to the public.
Prerequisite(s): ACC 298
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Business or Engineering and Computer Science or Arts, Sciences, and Letters

ACC 355  Cost Accounting and Analysis  3 Credit Hours
To study the development, analysis and interpretation of accounting information for planning and controlling costs and revenues. Topics include: cost concepts, cost behavior, product costing systems, cost allocation systems, budgeting, standard costs and variance analysis and performance evaluation techniques.
Prerequisite(s): (ACC 356 or ACC 358) and BE 401

ACC 356  Intermediate Financial Acct 1  3 Credit Hours
To study the accounting function in the business environment; review the operations and operating cycles in service, merchandising, and manufacturing industries; the conceptual accounting base of recording revenue and matching expenses at the traditional point of sale or delivery; the current state of the accounting profession; and an overview of financial accounting statements.
Prerequisite(s): ACC 299 and ACC 380* and ACC 381*

ACC 357  Intermediate Financial Acct 2  3 Credit Hours
To study financing and investing issues in today's international business environment, including financing through various ownership and debt instruments, off-balance sheet financing and leverage; investing in tangible and intangible operating assets; investing in financial instruments for return and risk management purposes; and investing in financial instruments to influence or control operations of other business units.
Prerequisite(s): ACC 356 and ACC 380 and ACC 381 and FIN 401*

ACC 358  Financial Reporting  3 Credit Hours
This course provides an intermediate level analysis of financial accounting focusing on recognition, measurement, and reporting issues associated with assets, liabilities and owner equity in conjunction with related income determination questions. The course is designed for financial statement information users who need a level of sophistication beyond an introductory level, yet not the complete technical expertise of a financial accountant. (YR).
Prerequisite(s): ACC 298

ACC 360  Federal Income Taxation  3 Credit Hours
To acquaint the student with the federal income tax, tax research, tax planning, and application of tax laws to taxable entities. The course will introduce the student to a broad range of tax concepts within a framework of financial accounting principles. Emphasis will be placed on the taxation of business entities, individual taxpayers, and the differences between financial and tax accounting. The use of technology to research problem assignments will be used to develop students’ business communication and problem solving skills.
Prerequisite(s): ACC 356 or ACC 358 or FIN 411

ACC 380  Accounting Information Systems  3 Credit Hours
To study the concepts, theory, organization and application of accounting information systems and the flow of accounting data through transaction cycles. Topics include: the principles of accounting systems design, internal control analysis and development and the overall evaluation of networked computer-based accounting systems. Emphasis is placed on transaction processing systems, internal control systems, and computer-assisted decision making for unstructured problems by employing accounting databases.
Prerequisite(s): ACC 299
Corequisite(s): ACC 381

ACC 381  Accounting Info Sys Lab  1 Credit Hour
ACC 381 is a lab component of ACC 380. Students will complete weekly laboratory assignments to reinforce the concepts of ACC 380 to use information technology to solve business problems. In addition, the use of several common applications (e.g., Word, Excel, Access, and PowerPoint) will also be covered at the beginning to advanced levels.
Prerequisite(s): ACC 299
Corequisite(s): ACC 380
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ACC 403  Advanced Managerial Accounting  3 Credit Hours
This course is intended to equip students with both theoretical and practical tools to manage all significant facets of production process costs, revenue streams, budgeting, and the related reporting system. The course focuses on topics such as managing “upstream” cost, cost structures, control tools, establishing standards, reporting processes, analysis to improve per unit profitability, and budgeting. The above topics will be used to develop resource plans to achieve management's objectives. (YR).
Prerequisite(s): ACC 355

ACC 416  Advanced Financial Acct 1  3 Credit Hours
To study advanced operating issues of revenue recognition and matching related expenses, including compensation, taxation, and capital costs; and a comprehensive analysis of financial statements, the related disclosures, and their information content.
Prerequisite(s): ACC 357 or ACC 358
ACC 417  Adv Financial Accounting 2  3 Credit Hours
This course is intended to help students gain expertise in preparing financial statements for complex business organizations. Specific topics include: the preparation of segmental and consolidated financial statements; intricate accounting issues associated with business combinations including but not limited to combinations at the date of acquisition and periods post acquisition; analysis of inter-company transactions such as inventory and asset transfers between parent and subsidiary; reporting for segments of a business as well as interim reporting; foreign exchange issues including inter-period reporting and financial statement translation; international reporting issues associated with all of the above, as well as, other topics. (YR)
Prerequisite(s): ACC 357

ACC 438  Advanced Federal Income Tax  3 Credit Hours
To acquaint the student with the concepts of federal taxation, tax research, tax planning, and application of tax laws to taxable entities. The course will introduce the student to a broad range of tax concepts within a framework of financial accounting principles. Emphasis will be placed on the taxation of business entities and the differences between financial and tax accounting. The use of technology to research problem assignments will be used to develop students’ business communication and problem solving skills.
Prerequisite(s): ACC 360

ACC 439  Not-for-Profit Accounting  3 Credit Hours
To study the principles and procedures of accounting for not-for-profit organizations. Topics may include: state and local government financial accounting, financial accounting for selected other entities, managerial concepts and current issues. Students will not receive credit for both ACC 439 and ACC 539.
Prerequisite(s): ACC 356

ACC 457  Auditing  3 Credit Hours
To introduce students to the audit profession, process, and practice. Topics include general auditing and ethical standards, principles of internal control and audit objectives, audit testing and sampling techniques, as well as the auditor’s responsibility for communications and risk assessment.
Prerequisite(s): ACC 357 and BE 401
Restriction(s):
Can enroll if Class is Senior

ACC 480  Information Tech Eval& Control  3 Credit Hours
The course emphasizes the control and evaluation of information systems to ensure accounting and management financial reporting and information processing objectives are accomplished. The course covers the theory of control evaluation, design of internal control, and the evaluation of internal controls in traditional and emerging information technology environments. Emphasis will be placed on current technologies in use by business organizations, emerging technologies, and the application of current profession guidance to evaluate existing and proposed information systems. (YR)
Prerequisite(s): (ACC 380 or MIS 310) and ACC 457*

ACC 482  Seminar: Accounting  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Business Studies as a Secondary Major
(not available to College of Business majors)

The Business Studies major combines foundational courses in business with the liberal arts. It is meant to complement a non-business student’s program of study by offering primary business topics as well as the necessary analytical tools required for careers in management related fields. Students cannot pursue this major either on its own or in conjunction with a business major.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo) section for additional information.

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Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

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Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Prerequisites to the Major

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td></td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td></td>
</tr>
<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
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</table>

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mkgt Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Select one course from the following:</td>
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<tr>
<td>DS 301</td>
<td>Intro Business Statistics</td>
<td></td>
</tr>
<tr>
<td>ECON 305</td>
<td>Economic Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 325</td>
<td>Probability</td>
<td></td>
</tr>
</tbody>
</table>

### Concentration Requirements

#### General Business Concentration

Three courses from any 300 or 400 level COB course (Excluding BA 300, BPS 451, and any BI course). No two of which can be from the same discipline.

#### Communications Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 340</td>
<td>Professional Communication</td>
<td>3</td>
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<tr>
<td>or BA 330</td>
<td>Managerial Communication</td>
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<td>Select two courses from the following:</td>
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<tr>
<td>COMM 220</td>
<td>Intro to Media &amp; Culture</td>
<td></td>
</tr>
<tr>
<td>COMM 260</td>
<td>Public Relations Principles</td>
<td></td>
</tr>
<tr>
<td>COMM 300</td>
<td>Communication Research Methods</td>
<td></td>
</tr>
<tr>
<td>COMM 360</td>
<td>Social Media for PR</td>
<td></td>
</tr>
<tr>
<td>COMM 366</td>
<td>Public Comm and Culture Stdies</td>
<td></td>
</tr>
<tr>
<td>COMM 420</td>
<td>Critical Media Studies</td>
<td></td>
</tr>
<tr>
<td>COMM 460</td>
<td>Public Relations Campaigns</td>
<td></td>
</tr>
<tr>
<td>COMM 477</td>
<td>Prof Communication Ethics</td>
<td></td>
</tr>
<tr>
<td>MKT 458</td>
<td>Advertising</td>
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</tr>
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</table>

Total Credit Hours 9

#### Economics Concentration

<table>
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<tr>
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<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Required – Three courses from the following:</td>
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</tr>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td></td>
</tr>
<tr>
<td>or ECON 302</td>
<td>Intermediate Microeconomics</td>
<td></td>
</tr>
<tr>
<td>BE 403</td>
<td>Business Conditions Analysis</td>
<td></td>
</tr>
<tr>
<td>or ECON 301</td>
<td>Intermediate Macroeconomics</td>
<td></td>
</tr>
<tr>
<td>ECON 311</td>
<td>Money and Banking</td>
<td></td>
</tr>
<tr>
<td>or FIN 443</td>
<td>Com Bank: Functn and Operatns</td>
<td></td>
</tr>
<tr>
<td>ECON/STS 321</td>
<td>Labor in the American Economy</td>
<td></td>
</tr>
<tr>
<td>ECON 331</td>
<td>Industrial Organization</td>
<td></td>
</tr>
<tr>
<td>ECON 335</td>
<td>Experimental Economics</td>
<td></td>
</tr>
<tr>
<td>ECON 433</td>
<td>Antitrust and Regulation</td>
<td></td>
</tr>
<tr>
<td>ECON 438</td>
<td>Beh Econ for Business &amp; Policy</td>
<td></td>
</tr>
<tr>
<td>ECON 447</td>
<td>International Finance</td>
<td></td>
</tr>
<tr>
<td>ECON 448</td>
<td>International Trade</td>
<td></td>
</tr>
<tr>
<td>ECON 4021</td>
<td>Economics of the Labor Sector</td>
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</tr>
<tr>
<td>IB 441</td>
<td>International Financial Mgmt</td>
<td></td>
</tr>
<tr>
<td>IB 446</td>
<td>International Business</td>
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</tbody>
</table>

Total Credit Hours 9
Entrepreneurship Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required:</td>
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</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking &amp; Behavior</td>
<td>3</td>
</tr>
<tr>
<td>ENT 401</td>
<td>New Venture Planning</td>
<td>3</td>
</tr>
<tr>
<td>ENT 402</td>
<td>Entrep, Corp Entrep &amp; Society</td>
<td>3</td>
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<tr>
<td>Total Credit Hours</td>
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</table>

Psychology Concentration

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required - Three courses from the following:</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>HRM 305</td>
<td>Human Resource Policy/ Admin</td>
<td>3</td>
</tr>
<tr>
<td>MKT 382</td>
<td>Understanding Customers</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 320</td>
<td>Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 363</td>
<td>Cognitive Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 3955</td>
<td>Diversity and the Workplace</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 4305</td>
<td>Psychology in the Workplace</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 464</td>
<td>Applied Cognitive Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Digital Marketing

Digital marketing is where marketing meets digital media, such as the internet, social media, cell phones and video games. Digital marketing covers activities such as search engine optimization, viral marketing, web analytics, social network marketing, experiment-based market research, and reputation management. Majoring in digital marketing and marketing is not permitted.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

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Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Business Administration Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 300</td>
<td>Career Planning &amp; Develop</td>
<td>1</td>
</tr>
<tr>
<td>BA 320</td>
<td>Proj Mgmt &amp; Leadership Skills</td>
<td>3</td>
</tr>
<tr>
<td>BA 330</td>
<td>Managerial Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 400</td>
<td>Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 451</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 302</td>
<td>Advanced Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 380</td>
<td>Accounting Information Systems &amp; ACC 381 &amp; Accounting Info Sys Lab</td>
<td>3</td>
</tr>
<tr>
<td>LE 253</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mkrg Principles &amp; Policies</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>40-41</td>
</tr>
</tbody>
</table>

1 Note: ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.
Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 363</td>
<td>Digital Consumer Srch&amp;Mktg</td>
<td>3</td>
</tr>
<tr>
<td>MKT 454</td>
<td>Marketing Research</td>
<td>3</td>
</tr>
<tr>
<td>MKT 455</td>
<td>E-tailing and Retailing</td>
<td>3</td>
</tr>
<tr>
<td>MKT 458</td>
<td>Advertising</td>
<td>3</td>
</tr>
<tr>
<td>MKT 463</td>
<td>Digital Analytics&amp;Content Mktg</td>
<td>3</td>
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<tr>
<td></td>
<td>Select two courses from the following:</td>
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</tr>
<tr>
<td></td>
<td>DS 310</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ISM 321</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ISM 371</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ISM 382</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 382</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 402</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 457</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 460</td>
<td>3</td>
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</table>

Total Credit Hours: 21

Digital Marketing Minor

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>MKT 363</td>
<td>Digital Consumer Srch&amp;Mktg</td>
<td>3</td>
</tr>
<tr>
<td>MKT 463</td>
<td>Digital Analytics&amp;Content Mktg</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select two courses from the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MKT 454</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 455</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 458</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MKT 498</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 15

Entrepreneurship

The Minor and Certificate in Entrepreneurship can complement any field of study.

Gain the tools and skills you need to familiarize yourself with tasks such as market assessment, capital formation, business planning, effective communication, staffing, systems design, financial planning and operations management. The minor and certificate focus on the research, planning, and strategies that are critical to start a new business, take over a family business, or quickly advance in your field. Both programs are open to all undergraduate students at UM-Dearborn. Non-degree seeking candidates as well as guest students with or without college degrees may be eligible for the Certificate.

Certificate Admission

Current UM-Dearborn undergraduate students:

- Open to anyone with a GPA of at least 2.0.
- Must declare the Entrepreneurship certificate by submitting the declaration of certificate form (https://umich.app.box.com/s/4dt8koj3qwowyuyyp2qjajy6pcanyvx/) to their academic unit office.

Guest students:

- Open to anyone interested in learning more about entrepreneurship.
- Guest students should fill out the UM-Dearborn guest application (http://umdearborn.edu/gueststudents/). Then, notify the College of Business by filling out the declaration of certificate form (http://umdearborn.edu/cob/fileadmin/template/som/files/undergrad/docs/Declaration_of_Certificate.pdf) and send it to cboatin@umich.edu or drop it off in the student services office at 168 Fairlane Center South. (Admission to persons not holding a college degree will be limited to five per academic term.)

Goals of the Certificate

Goal 1: Students will apply a working knowledge of the principles of entrepreneurship to analysis and problem solving. Objectives: Students will be able to:

- 1a Creatively analyze the business environment for opportunities
- 1b Recognize problems and convert them into opportunities

Goal 2: Students will understand how to apply entrepreneurial techniques in an organizational setting. Objectives: Students will be able to:

- 2a Use the entrepreneurial mindset in various business settings
- 2b Apply the concepts of entrepreneurship in their chosen field of work

Goal 3: Students will gain an understanding of the steps that might take in their own entrepreneurial pursuits. Objectives: Students will be able to:

- 3a Identify local resources for starting their own entrepreneurial ventures

Entrepreneurship Minor

Prerequisite

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
<td>3</td>
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</tbody>
</table>

Minor Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 401</td>
<td>New Venture Planning</td>
<td>3</td>
</tr>
<tr>
<td>ENT 402</td>
<td>Entrep, Corp Entrep &amp; Society</td>
<td>3</td>
</tr>
<tr>
<td>BA 491</td>
<td>Bus Experiential Learning</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select one course from the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACC 439</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ANTH 320</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ANTH 325</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BPS 441</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHE 401</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>COMM 360</td>
<td>3</td>
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</tbody>
</table>
The Dearborn Discovery Core different categories. Please see the any approved course to satisfy up to three credit hours within three credit hours. The minimum GPA for the program is 2.0. In addition, the DDC permits students in courses offered by the College of Business. College of Business BBA program cannot elect more than 30 credit hours in Financial Services. Students not enrolled in the major offers flexibility for developing careers in investments, financial institutions and corporate finance. The program offers analytical rigor, theoretical knowledge and teaching methods that stress hands-on applications. The program also equips students for the relevant professional examinations such as Chartered Financial Analysts (CFA), Certified Financial Management (CFM), and Certified Financial Planning (CFP). Finance internships historically have proven to be among the most numerous and challenging available. Students majoring in Finance may choose an optional concentration in Financial Management or Financial Institutions.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)


Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Business Administration Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<td>BA 300</td>
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<tr>
<td>BA 330</td>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
<td>BPS 451</td>
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<td>3</td>
</tr>
<tr>
<td>DS 302</td>
<td>Advanced Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
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</table>

Certificate Requirements

The Certificate in Entrepreneurship requires 3 courses (9 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
<td>3</td>
</tr>
<tr>
<td>ENT 401</td>
<td>New Venture Planning</td>
<td>3</td>
</tr>
<tr>
<td>ENT 402</td>
<td>Entrep, Corp Entrep &amp; Society</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 12

Finance

The Finance major offers flexibility for developing careers in investments, financial institutions and corporate finance. The program offers analytical rigor, theoretical knowledge and teaching methods that stress hands-on applications. The program also equips students for the relevant professional examinations such as Chartered Financial Analysts (CFA), Certified Financial Management (CFM), and Certified Financial Planning (CFP). Finance internships historically have proven to be among the most numerous and challenging available. Students majoring in Finance may choose an optional concentration in Financial Management or Financial Services.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ECON 325</td>
<td>Economics of Pov and Discrm</td>
<td></td>
</tr>
<tr>
<td>EDB 422</td>
<td>Lead.Advoc, Admin Early Ch Prg</td>
<td></td>
</tr>
<tr>
<td>EDC 442</td>
<td>EC: Fam/Sch/Comm Collaboration</td>
<td></td>
</tr>
<tr>
<td>ENGL 364</td>
<td>Writing for Civic Literacy</td>
<td></td>
</tr>
<tr>
<td>ENGL 467</td>
<td>Script-Writing Workshop</td>
<td></td>
</tr>
<tr>
<td>ENGR 360</td>
<td>Des Inovtn: Proc, Meth &amp; Prtct</td>
<td></td>
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<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
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</tr>
<tr>
<td>FIN 411</td>
<td>Financial Planning</td>
<td></td>
</tr>
<tr>
<td>FIN 412</td>
<td>Retirement Planning</td>
<td></td>
</tr>
<tr>
<td>HHS 350</td>
<td>Comm Organizing for Health</td>
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<tr>
<td>HHS 404</td>
<td>Financing Health &amp; Medical Sys</td>
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<tr>
<td>HIST 3651</td>
<td>Women Leadership/Social Change</td>
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<tr>
<td>HIST 3695</td>
<td>American City</td>
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<tr>
<td>ISM 371</td>
<td>IT Strategy: Disrupting Norms</td>
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<tr>
<td>MKT 434</td>
<td>Sales Mgmt &amp; Personal Selling</td>
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</tr>
<tr>
<td>MKT 436</td>
<td>Business to Business MkTG</td>
<td></td>
</tr>
<tr>
<td>MKT 471</td>
<td>Innovation, Entrepreneurship, and Creativity</td>
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<tr>
<td>POL 466</td>
<td>Politics&amp;Policies Soc Welfare</td>
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</tr>
<tr>
<td>POL 484</td>
<td>Revitalizing Cities</td>
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<tr>
<td>OB 401</td>
<td>Management Skills Development</td>
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<tr>
<td>OB 403</td>
<td>Negotiation and Conflict Mgt</td>
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Total Credit Hours 9
### Finance Major (without a concentration)

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>ACC 357</td>
<td>Intermediate Financial Acct 2</td>
<td>3</td>
</tr>
<tr>
<td>or ACC 358</td>
<td>Financial Reporting</td>
<td></td>
</tr>
<tr>
<td>FIN 407</td>
<td>Investment Fundamentals</td>
<td>3</td>
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</table>

Select five courses from the following (at least four courses must be from BE, FIN, or IB):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ACC 355</td>
<td>Cost Accounting and Analysis</td>
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<tr>
<td>ACC 416</td>
<td>Advanced Financial Acct 1</td>
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</tr>
<tr>
<td>BE 403</td>
<td>Business Conditions Analysis</td>
<td></td>
</tr>
<tr>
<td>FIN 402</td>
<td>Advanced Corporate Finance</td>
<td></td>
</tr>
<tr>
<td>FIN 406</td>
<td>Fin Mkts and Institutions</td>
<td></td>
</tr>
<tr>
<td>FIN 411</td>
<td>Financial Planning</td>
<td></td>
</tr>
<tr>
<td>FIN 443</td>
<td>Com Bank: Functn and Operatns</td>
<td></td>
</tr>
<tr>
<td>FIN 445</td>
<td>Corporate Fin Models and Appls</td>
<td></td>
</tr>
<tr>
<td>FIN 447</td>
<td>Derivative Markets</td>
<td></td>
</tr>
<tr>
<td>FIN 456</td>
<td>Fixed Income Securities</td>
<td></td>
</tr>
<tr>
<td>FIN 457</td>
<td>Investment Fund Management</td>
<td></td>
</tr>
<tr>
<td>FIN 484</td>
<td>Seminar: Financial Management</td>
<td></td>
</tr>
<tr>
<td>FIN 494</td>
<td>Research:Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>IB 441</td>
<td>International Financial Mgmt</td>
<td></td>
</tr>
<tr>
<td>ISM 382</td>
<td>Advanced Computer Applications</td>
<td></td>
</tr>
<tr>
<td>MKT 434</td>
<td>Sales Mgmt &amp; Personal Selling</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours: 21

---

### Finance Major with a concentration in Financial Services

#### Finance Major with a concentration in Financial Services

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 357</td>
<td>Intermediate Financial Acct 2</td>
<td>3</td>
</tr>
<tr>
<td>or ACC 358</td>
<td>Financial Reporting</td>
<td></td>
</tr>
<tr>
<td>FIN 406</td>
<td>Fin Mkts and Institutions</td>
<td>3</td>
</tr>
<tr>
<td>FIN 407</td>
<td>Investment Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>FIN 443</td>
<td>Com Bank: Functn and Operatns</td>
<td>3</td>
</tr>
<tr>
<td>FIN 447</td>
<td>Derivative Markets</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two courses from the following (at least one course must be from BE, FIN, or IB):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 403</td>
<td>Business Conditions Analysis</td>
<td></td>
</tr>
<tr>
<td>FIN 402</td>
<td>Advanced Corporate Finance</td>
<td></td>
</tr>
<tr>
<td>FIN 411</td>
<td>Financial Planning</td>
<td></td>
</tr>
<tr>
<td>FIN 456</td>
<td>Fixed Income Securities</td>
<td></td>
</tr>
<tr>
<td>FIN 457</td>
<td>Investment Fund Management</td>
<td></td>
</tr>
<tr>
<td>FIN 484</td>
<td>Seminar: Financial Management</td>
<td></td>
</tr>
<tr>
<td>FIN 494</td>
<td>Research:Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>IB 441</td>
<td>International Financial Mgmt</td>
<td></td>
</tr>
<tr>
<td>ISM 382</td>
<td>Advanced Computer Applications</td>
<td></td>
</tr>
<tr>
<td>MKT 434</td>
<td>Sales Mgmt &amp; Personal Selling</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours: 21

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### Finance Minor

#### Prerequisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ECON 202</td>
<td>and Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
<td></td>
</tr>
<tr>
<td>DS 301</td>
<td>Intro Business Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

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1. Finance majors may be eligible to apply internship credit (BI 350 or 450) towards a Finance elective course. These internships must be approved in advance by the discipline faculty and department chairperson. Please see an advisor for specific details.
### Minor Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 402</td>
<td>Advanced Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 407</td>
<td>Investment Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Select two courses from the following:</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td>ACC 358</td>
<td>Financial Reporting</td>
<td></td>
</tr>
<tr>
<td>FIN 443</td>
<td>Com Bank: Functn and Operatns</td>
<td></td>
</tr>
<tr>
<td>FIN 445</td>
<td>Corporate Fin Models and Appls</td>
<td></td>
</tr>
<tr>
<td>FIN 447</td>
<td>Derivative Markets</td>
<td></td>
</tr>
<tr>
<td>FIN 457</td>
<td>Investment Fund Management</td>
<td></td>
</tr>
<tr>
<td>FIN 484</td>
<td>Seminar: Financial Management</td>
<td></td>
</tr>
<tr>
<td>IB 441</td>
<td>International Financial Mgmt</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 15

### Financial Planning Minor

#### Prerequisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ECON 202</td>
<td>and Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td>4</td>
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<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
<td></td>
</tr>
<tr>
<td>DS 301</td>
<td>Intro Business Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

### Minor Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 407</td>
<td>Investment Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>FIN 411</td>
<td>Financial Planning</td>
<td>3</td>
</tr>
<tr>
<td>FIN 412</td>
<td>Retirement Planning</td>
<td>3</td>
</tr>
<tr>
<td>or ACC 360</td>
<td>Federal Income Taxation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Select one course from the following:</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>ACC 360</td>
<td>Federal Income Taxation</td>
<td></td>
</tr>
<tr>
<td>FIN 406</td>
<td>Fin Mkts and Institutions</td>
<td></td>
</tr>
<tr>
<td>FIN 412</td>
<td>Retirement Planning</td>
<td></td>
</tr>
<tr>
<td>MKT 434</td>
<td>Sales Mgmt &amp; Personal Selling</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 15

### FIN 401 Corporate Finance 3 Credit Hours

Introduces the financial goals of a corporation with particular attention to the creation of value. The time value of money and the valuation of financial and real assets receive particular attention. Additional topics include risk and return, market efficiency, short-term financial management, and the domestic and international economic environments.

**Prerequisite(s):** ACC 298 and ECON 201 and ECON 202 and (DS 300* or DS 301* or IMSE 317*)

### FIN 402 Advanced Corporate Finance 3 Credit Hours

To provide the study of advanced topics, with particular attention to capital structure and dividend policy. Additional topics such as hedging, option pricing, agency theory, methods of financing, and corporate control will be presented. Global aspects of these topics will be addressed where appropriate. (YR).

**Prerequisite(s):** FIN 401 and (DS 300 or DS 301)

### FIN 406 Fin Mkts and Institutions 3 Credit Hours

This course will introduce students to the financial markets, institutions, and instruments. The contents consist of the role and importance of the financial markets, interest rate determination and security valuation, the functions of money, bond, mortgage, stock, foreign exchange and derivative securities markets, the activities of financial institutions such as insurance companies, securities firms and investment banks, hedge funds, and pension funds, and management of credit and interest rate risks on the balance sheet of financial institutions. Familiarity with these topics is necessary for students to be competent in their future professional career in finance. (YR)

**Prerequisite(s):** FIN 401 and (DS 300 or DS 301)

### FIN 407 Investment Fundamentals 3 Credit Hours

To study the current investment scene and analyze the characteristics of securities and the role in investment strategies. Topics include: securities markets, bonds, stocks, options, investment strategies, portfolio theories and management.

**Prerequisite(s):** FIN 401 and (DS 300 or DS 302)

### FIN 411 Financial Planning 3 Credit Hours

This course introduces students to the primary areas of personal financial planning and helps them prepare for the professional financial planning examinations. Topics include overview of the financial planning process, analysis of clients’ needs; principles of personal income taxation, investment analysis and planning; retirement and estate planning; insurance planning and major types of insurance, ethics and standards of professional practice; and quantitative methods used in the analysis and derivations of decision rules. This course is designed for students who consider a career in financial advising, as well as those who are interested in managing their own personal finances. Students will practice critical thinking and business communication through written presentation of case analysis and recommendations. (YR)

**Prerequisite(s):** FIN 401 and (DS 300 or DS 301)
FIN 412  Retirement Planning  3 Credit Hours
This course introduces students to the nature of retirement planning analysis and the functions of major retirement plans and other investment-oriented employee benefits, as well as discusses advantages and disadvantages of the various wealth accumulation and tax deferral alternatives. Topics include the administration, characteristics and distributions of qualified corporate retirement plans such as pension and profit sharing plans; non-corporate retirement programs such as IRAs and Simplified Employee Pension (SEPs) plans. In addition, stock options, non-qualified deferred compensation plans, and other non-pension related benefits, as well as recent legislation will be examined. This course prepares students for career pursuit in financial advising or human resources management, as well as for the professional financial planning examinations. Students will practice critical thinking and business communication through written presentation of case analysis and recommendations. (YR)
Prerequisite(s): FIN 401 and (DS 300 or DS 301) and FIN 411*

FIN 443  Com Bank: Functn and Operatns  3 Credit Hours
The topics to be included in the course are: commercial bank management, loan portfolio management and international banking. Specific aspects of the commercial banking environment, such as legislation and regulation, are also covered.
Prerequisite(s): FIN 401 and (DS 300 or DS 301)

FIN 445  Corporate Fin Models and Apps  3 Credit Hours
This course focuses on the analysis of financial decisions by applying theories and models to practical problems and cases. The subject coverage includes capital budgeting and financing (cost of capital, capital structure, dividend policy, etc.), working capital management (credit, inventory, bank relations, etc.), and other special topics (e.g., mergers and acquisitions). The coursework is appropriate for students seeking careers in corporate financial management, commercial lending, and investment banking.
Prerequisite(s): FIN 402 and (DS 300 or DS 302)

FIN 447  Derivative Markets  3 Credit Hours
Going beyond investment fundamentals, the focus of this course is on the more speculative aspects of investment. Speculative securities (such as options, warrants, and convertibles) and commodity futures (including financial and currency futures) are covered. The structure of the speculative markets and the role of speculation, such as hedging, risk-shifting, and the establishment of future-spot price relationship are analyzed in the context of a competitive market environment.
Prerequisite(s): FIN 401 and (FIN 402 or FIN 407 or FIN 443) and (DS 300 or DS 302*)

FIN 448  Real Estate Financing  3 Credit Hours
The purpose of this course is to introduce the student to the different types of mortgages, the sources of real estate loans and the workings of the secondary mortgage markets. It will also cover the application, loan processing, underwriting, and closing processes as well as closely related topics such as property appraisal and insurance, title insurance, and foreclosures.
Prerequisite(s): FIN 401

FIN 456  Fixed Income Securities  3 Credit Hours
The fixed income market, accompanied by the introduction of sophisticated financial engineering techniques, has grown enormously over the last two decades. Today, the fixed income market has been a vital segment of the global financial market. This course covers major topics associated with this market, including bond pricing, yields, and volatility; term structure of interest rates and yield curve; market structure and analytical techniques for Treasury, municipal, corporate bonds, mortgage-backed securities, asset-backed securities, and bond with embedded options. The fundamental objective of this course is to help students develop analytical skills for pricing fixed income securities and managing interest rate risk. In addition, materials covered in this course are compatible with the Common Body of Knowledge in Analysis of Debt Investments that is required by the Chartered Financial Analysts (CFA) examination. Students will not receive credit for both FIN 456 and FIN 656.
Prerequisite(s): FIN 407 and FIN 447 and (MATH 113 or MATH 115 or Mathematics Placement with a score of 116)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Business
Can enroll if Major is Finance

FIN 457  Investment Fund Management  3 Credit Hours
This course introduces finance students to investing approaches and analytical techniques including both Intrinsic and Relativistic analyses used for security analysis employed and implemented by professional money managers. The course is recommended for finance students seeking to develop careers related to money management, investment analysis, financial analysis, portfolio management and related financial services careers. The main focus of the course is to gain the experience and skills of equity securities analyses through the Student Managed Investment Fund. The course requires application of fundamental and intrinsic equity analyses valuation. Students cannot receive credit for both FIN 457 and FIN 657. (F,W,OC)
Prerequisite(s): FIN 407

FIN 484  Seminar: Financial Management  1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Prerequisite(s): FIN 401
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

FIN 494  Research:Financial Mgt  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Prerequisite(s): FIN 401
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.
Financial Planning

The Financial Planning certificate complements a number of fields, such as finance, marketing, accounting, and economics.

Gain the tools and skills you need to familiarize yourself with tasks such as personal financial planning, investment planning, retirement planning, tax planning, estate planning, and risk management. The program is open to all undergraduate students at UM-Dearborn.

Students interested in preparing for the professional financial planning examinations may wish to complete the Financial Planning minor (p. 515), which includes the courses in this certificate program.

Admission

The certificate in Financial Planning is available to current UM-Dearborn undergraduate students:

• Open to any UM-Dearborn undergraduate student with a GPA of at least 2.0.
• Must declare the Financial Planning certificate by submitting the declaration of certificate form (https://umich.app.box.com/s/4dt8koj3qwwvryuyp2qjaxyj6pcanyvx/) to their academic unit office.

Goals of the Certificate

Goal 1: Students will explain the components of financial planning.

Goal 2: Students will be able to develop a retirement savings plan for an individual.

Goal 3: Students will describe an ethics framework for a personal financial planner.

Certificate Requirements

The Certificate in Financial Planning requires 4 courses or 12 credit hours.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 411</td>
<td>Financial Planning</td>
<td>3</td>
</tr>
<tr>
<td>FIN 412</td>
<td>Retirement Planning</td>
<td>3</td>
</tr>
<tr>
<td>Select two of the following:</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>ACC 360</td>
<td>Federal Income Taxation</td>
<td></td>
</tr>
<tr>
<td>FIN 407</td>
<td>Investment Fundamentals</td>
<td></td>
</tr>
<tr>
<td>MKT 434</td>
<td>Sales Mgmt &amp; Personal Selling</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 12

Note that the required courses have a prerequisite (FIN 401). This course is required of College of Business students but would be in addition to the 12 credit requirement for most students not in the College of Business.

General Business

The major in general business has been designed for students seeking a broad business background rather than a specialization in any one functional area of business. Coursework to complete the General Business major must be upper division business credits beyond the BBA core (excluding business internship). Students majoring in General Business may choose an optional concentration in Pre-Law. General Business students will not be permitted to combine this major with any other College of Business major.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)
Intersections (GEIN) – 6 Credits

Capstone

Capstone (GECE) – 3 Credits

Business Administration Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 300</td>
<td>Career Planning &amp; Develop</td>
<td>1</td>
</tr>
<tr>
<td>BA 320</td>
<td>Proj Mgmt &amp; Leadership Skills</td>
<td>3</td>
</tr>
<tr>
<td>BA 330</td>
<td>Managerial Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 400</td>
<td>Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 451</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 302</td>
<td>Advanced Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3-4</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 380</td>
<td>Accounting Information Systems</td>
<td>1</td>
</tr>
<tr>
<td>&amp; ACC 381</td>
<td>and Accounting Info Sys Lab ¹</td>
<td></td>
</tr>
<tr>
<td>LE 253</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 40-41

¹ Note: ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

General Business Major (18 credit hours)

18 credit hours from College of Business course work beyond the BBA core.

General Business Major with a concentration in Pre-law

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Required</td>
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</tr>
<tr>
<td>LE 453</td>
<td>Business Law: Advanced Topics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select three courses from 300-400 level COB courses beyond the core. Each must be a different subject.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Select two courses from the following:</td>
<td>6</td>
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<tr>
<td>CRJ/POL 445</td>
<td>Contemporary Ethical Theory</td>
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<tr>
<td>CRJ/POL 302</td>
<td>Theory of the Law</td>
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<tr>
<td>CRJ/POL 316</td>
<td>The American Judicial Proc.</td>
<td></td>
</tr>
<tr>
<td>CRJ/POL 413</td>
<td>American Constitutional Law</td>
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</tr>
<tr>
<td>CRJ/POL 414</td>
<td>Civil Rights and Liberties</td>
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</tr>
<tr>
<td>CRJ/PHIL 335</td>
<td>Philosophy of Law</td>
<td></td>
</tr>
</tbody>
</table>

Human Resource Management

The Human Resources Management major courses are designed as fundamental preparation for positions in human resource management, industrial relations, or general management. A Human Resources Management major would also be valuable to students who are not contemplating a career in human resources, as these courses provide knowledge and skills for selecting, developing, motivating, retaining, evaluating, and directing employees - skills needed by managers in any technical or business domain.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits

Upper Level Writing Intensive (GEWI) – 3 Credits

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits

Critical and Creative Thinking (GECC) – 3 Credits

Areas of Inquiry

Natural Science (GENS) – 7 Credits

- Lecture/Lab Science Course
- Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits

Human Resource Management

Humanities and the Arts (GEHA) – 6 Credits

Intersections (GEIN) – 6 Credits

Capstone

Capstone (GECE) – 3 Credits

Business Administration Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
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<td>Accounting Information Systems and Accounting Info Sys Lab</td>
<td>3</td>
</tr>
<tr>
<td>LE 253</td>
<td>Business Law</td>
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<tr>
<td>MKT 352</td>
<td>Mkgt Principles and Policies</td>
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</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>40-41</td>
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</tr>
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</table>

1 Note: ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

Human Resource Management Minor

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRM 305</td>
<td>Human Resource Policy/Admin</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>Choose two courses from:</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>HRM 406</td>
<td>Talent Sourcing &amp; Acquisition</td>
<td></td>
</tr>
<tr>
<td>HRM 407</td>
<td>Compensation &amp; Performance Mgt</td>
<td></td>
</tr>
<tr>
<td>HRM 408</td>
<td>Legal Issues in Human Resource (Plus one course from the following)</td>
<td></td>
</tr>
<tr>
<td>HRM 409</td>
<td>Talent &amp; Leadership Develop</td>
<td></td>
</tr>
<tr>
<td>Choose one course from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HRM 406</td>
<td>Talent Sourcing &amp; Acquisition</td>
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<td>HRM 407</td>
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<td></td>
</tr>
<tr>
<td>HRM 408</td>
<td>Legal Issues in Human Resource</td>
<td></td>
</tr>
<tr>
<td>HRM 409</td>
<td>Talent &amp; Leadership Develop</td>
<td></td>
</tr>
<tr>
<td>OB 401</td>
<td>Management Skills Development</td>
<td></td>
</tr>
<tr>
<td>OB 402</td>
<td>Organizational Change &amp; Devlp</td>
<td></td>
</tr>
<tr>
<td>OB 403</td>
<td>Negotiation and Conflict Mgt</td>
<td></td>
</tr>
<tr>
<td>OB 404</td>
<td>Intl Dimensions of Org Behav</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

HRM 305 Human Resource Policy/Admin 3 Credit Hours
To examine personnel policy making and administration relative to the achievement of the objectives of the firm through the eyes of general management. Topics include: recruitment and selection, wage and salary administration training, evaluation, discipline and industrial relation activities. Cases are analyzed.

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
HRM 406  Talent Sourcing & Acquisition  3 Credit Hours
The course examines how to design, administer, and evaluate talent sourcing and selection activities that support organizational strategies. The course is geared both toward those who are or will be (a) current HR managers who develop and administer staffing programs and (b) managers in other functional areas who want to improve their personal effectiveness in recruiting and selecting employees. Key topics to be covered include: staffing strategy and planning; job design and analysis; external and internal recruiting; employee testing and assessment methods; interviewing; measurement, validation, and decision-making issues in selection; laws and regulations affecting staffing and evaluation methods for staffing.
Prerequisite(s): HRM 405 or HRM 305

HRM 407  Compensation & Performance Mgt  3 Credit Hours
The course examines how to design, administer and evaluate compensation and performance appraisal programs that support organizational strategies. The course is geared both toward those who are or will be (a) HR managers who will develop and administer pay and appraisal programs and (b) managers in other functional areas who want to improve their personal effectiveness in administering pay performance appraisals. Key topics to be covered include: merit and incentive pay, methods for internally valuing jobs, external labor markets and job pricing, design and administration of pay structures, employee benefits, compensating executives and expatriates, purposes and measurement methods for performance appraisals, performance criteria, rater processes and biases, performance reviews, and team-based pay and performance. (YR).
Prerequisite(s): (HRM 405 or HRM 305) and OB 354

HRM 408  Legal Issues in Human Resource  3 Credit Hours
The course examines employment law pertaining to human resource management including such areas as selection, compensation, performance appraisal, training, labor relations, and occupational safety and health.
Prerequisite(s): HRM 405 or HRM 305

HRM 409  Talent & Leadership Develop  3 Credit Hours
Training and leadership development are key elements of the human resource function. This course will teach students how to design and evaluate formal training programs and employee development programs, and how to conduct performance improvement interventions. Topics include needs assessment, adult learning and learning transfer theories, program design, and evaluation. (YR)
Prerequisite(s): HRM 305

HRM 485  Seminar:Human Resource Mgmt  1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

HRM 495  Research:Human Rsrch Mgmt  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Information Systems Management
The Information Systems Management major is designed to prepare students for positions in system development, system analysis, database administration, networking, and as ISM specialists in user departments such as finance, human resource management, marketing, and operations management. The major is also designed to prepare students to assume increasing levels of managerial responsibility as their career progresses. This course of study includes the components of computer-based information systems: hardware, software, telecommunications, databases, people (the people who develop, manage, run, program, maintain, and use the systems), and procedures (strategies, policies, methods, and rules involved in all aspects of information systems). This program teaches these principles and their application in a holistic and integrated fashion using a combination of traditional classroom instruction, case studies, projects, and hands-on methods.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Business Administration Core Requirements

<table>
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<tr>
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<th>Title</th>
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</tr>
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<td>3</td>
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<td>Select one of the following:</td>
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<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 380&amp; ACC 381</td>
<td>Accounting Information Systems and Accounting Info Sys Lab</td>
<td>3</td>
</tr>
<tr>
<td>LE 253</td>
<td>Business Law</td>
<td>3</td>
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<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
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</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
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<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
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<td>Total Credit Hours</td>
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Note: ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

Major Requirements

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<tbody>
<tr>
<td>ISM 301</td>
<td>Bus Application Programming</td>
<td>3</td>
</tr>
<tr>
<td>ISM 321</td>
<td>Database Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ISM 331</td>
<td>Info Systems Development</td>
<td>3</td>
</tr>
<tr>
<td>ISM 351</td>
<td>Networking and Collab Comp</td>
<td>3</td>
</tr>
<tr>
<td>ISM 431</td>
<td>Database Systems II</td>
<td>3</td>
</tr>
<tr>
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<td>Select two courses from the following:</td>
<td>6</td>
</tr>
<tr>
<td>ISM 302</td>
<td>Object-Oriented Programming</td>
<td></td>
</tr>
<tr>
<td>ISM 343</td>
<td>Social Network Analysis</td>
<td></td>
</tr>
<tr>
<td>ISM 347</td>
<td>Information Visualization</td>
<td></td>
</tr>
<tr>
<td>ISM 371</td>
<td>IT Strategy: Disrupting Norms</td>
<td></td>
</tr>
<tr>
<td>ISM 382</td>
<td>Advanced Computer Applications</td>
<td></td>
</tr>
<tr>
<td>ISM 383</td>
<td>Info Technology Security</td>
<td></td>
</tr>
<tr>
<td>ISM 387</td>
<td>Digital Security</td>
<td></td>
</tr>
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Information Systems Management Minor

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<td>Info Systems in Management</td>
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</tr>
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<tr>
<td>ISM 431</td>
<td>Database Systems II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours</td>
<td>15</td>
</tr>
</tbody>
</table>

ISM 120  Bus Prob Solving w/ Comp Apps  3 Credit Hours

Full Course Title: Business Problem Solving with Computer Applications- This course introduces students to business problems, processes, and professional practices with an emphasis on structuring and solving business problems using computer applications. Drawing on problems from a range of business disciplines such as accounting, finance, marketing, and operations management, students will define, model, and solve business problems using spreadsheet and database software. They will practice critical thinking and business communication through oral and written presentation of problem analysis and results. Credit cannot be given for ISM 120 and any of ITM 120, MIS 120, CIS 121, 122, 123. (F,W,S)
ISM 301  Bus Application Programming  3 Credit Hours
This course is an introduction to basic concepts in computer programming with an emphasis on business applications. In the course, students will develop an understanding of fundamental programming logic and learn to use basic programming structures to solve business problems. Students are introduced to program development cycle and programming principles. The course covers principles of program design, programming structures, data types and structures, program testing, and debugging. Emphasis is placed on the implementation of programs with procedural structures, along with graphical user interfaces and event driven code. Upon completion, students should be able to design, code, test, and debug programs based on business requirement using a selected programming language. Credit cannot be given for both ISM 301, ITM 301 and MIS 301.

ISM 302  Object-Oriented Programming  3 Credit Hours
This course introduces the basic concepts of object-oriented programming with an emphasis on business applications. Students will develop an understanding of object-oriented modeling and learn to use object-oriented analysis and design techniques to solve simple business problems. Students are introduced to OO application development methodology and environment. The course covers principles of object-oriented programming, objects and classes, abstract data types, implementation of inheritance and polymorphism, database access, and graphic user interfaces. Upon completion, students should be able to design, code, test, and debug programs based on business requirements using a selected object-oriented programming language. Credit cannot be given for both ISM 302, ITM 302 and MIS 302.
Prerequisite(s): ITM 301 or MIS 301 or ISM 301
Restriction(s):
Can enroll if Level is Undergraduate

ISM 303  iCreate: Mobile Apps  3 Credit Hours
In this course, the technologies of mobile computing are introduced. Prior knowledge of programming logic and object-oriented concepts are applied in building mobile applications. Topics include mobile development environment, user interface elements of a mobile device, gesture, location awareness, and file operations. Creative thinking and entrepreneurship are introduced and fostered via creating a student-initiated mobile application from idea to sale.
Prerequisite(s): ITM 301 or ISM 301
Restriction(s):
Can enroll if Level is Undergraduate

ISM 310  Info Systems in Management  3 Credit Hours
This course provides an overview of information systems in the business world. It presents an organizational view of how to use information technology to create competitive firms, manage global organizations, and provide useful products and services to customers. Topics include hardware, software, databases, telecommunications systems, the strategic use of information systems, the development of information systems, and social and ethical issues involved with information systems. Credit cannot be given for ITM 310, ISM 310 and MIS 310.
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

ISM 311  Mgmt Information Sys Lab  1 Credit Hour
ISM 311 is a lab component of ISM 310. Students will complete weekly laboratory assignments to reinforce the concepts of ISM 310 to use information technology to solve business problems. In addition, the use of several common applications (e.g., Word, Excel, Access, and PowerPoint) will also be covered at the beginning to advanced levels.
Prerequisite(s): ITM 310* or ISM 310*
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Business

ISM 321  Database Systems I  3 Credit Hours
This course examines the processes and tools used to design and implement database systems in business. The goal of this course is to provide adequate technical detail while emphasizing the organizational and implementation issues relevant to the management of computerized data in an organizational environment. A class project involving the design and implementation of a database using a microcomputer database management system is performed. Topics include concepts of database systems, conceptual database design, logical database design, physical database design, database implementation, and data retrieval. Credit cannot be given for ISM 321, ITM 321, MIS 321 and CIS 421.
Prerequisite(s): ITM 310 or MIS 310 or ACC 380 or ISM 310

ISM 331  Info Systems Development  3 Credit Hours
This course provides a foundation in systems analysis and design concepts, methodologies, techniques, and tools. Students will learn to analyze an organizational problem, define user requirements, design an information system, and plan an implementation. Methodologies covered will include the traditional life cycle approach as well as newer methodologies such as object-oriented approach, joint applications development (JAD), and prototyping. A semester-long project gives students the opportunity to apply these techniques to a business problem. This project will use technologies such as a computer-aided software engineering (CASE) tool, a database management system (DBMS), or a fourth-generation language. Credit cannot be given for ISM 331, ITM 331 and MIS 331.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380 and (ITM 321 or MIS 321 or ISM 321*)
Restriction(s):
Can enroll if Level is Undergraduate

ISM 343  Social Network Analysis  3 Credit Hours
This course provides students an introduction to the study of social networks and tools used to analyze such networks. The course will focus on understanding the causes and consequences of the patterns of relationships between individuals. Topics will include the small-world puzzle (six degrees of separation), the strength of weak ties, the spread of ideas through social networks, and related security applications. This course will examine data analysis techniques used by social network researchers and developers of social media websites. Concepts will be applied both with software and at small-scale with manual calculation.
(F.W.S)
Prerequisite(s): ISM 310 or ITM 310
ISM 347  Information Visualization  3 Credit Hours
Full Course Title: Information Visualization: Business Insight via Storytelling
Information visualization has been used greatly in various disciplines including media, business, and engineering. It is valuable in helping people analyze and understand information to lead to better solutions and decisions. This course will introduce students to the field of information visualization via a hands-on approach. Readings and lectures will provide an overview of the field. Students will learn visualization design and evaluation principles and learn how to acquire, parse, and analyze large datasets. Students will also learn tools and techniques for visualizing multivariate, temporal, text-based, geospatial, hierarchical, and network/graph-based data. (F,W,S)
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 351  Networking and Collab Comp  3 Credit Hours
This course provides an introduction to data communication, networks, distributed processing and collaborative computing. The course will study the technical and management aspects of computing networks and distributed systems supporting a wide range of organizational functions from organizational process to managerial strategic decision making, from personal to group to organizational computing. The applications of telecommunications in the work settings and management issues of telecommunications will be addressed. The social and organizational implications of the telecommunications technology are also examined. Credit cannot be given for ISM 351, ITM 351 and MIS 351.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 371  IT Strategy: Disrupting Norms  3 Credit Hours
Full Course Title: IT Strategy: Disrupting Industry Norms, Practices, and Structures: Businesses are in the early stages of an information revolution whereby IT is transforming industries, generating whole new human communities, creating new markets, and redefining basic business models. These disruptions, driven by IT, are becoming more and more common and have resulted in the emergence of new regulations, behaviors, and norms. When IT disrupts an industry, the fundamentals of the business models change in ways which are not immediately obvious. The emphasis of this course is on managerial and industry issues with a focus on the transformations of business models over the last ten years. Throughout this course you will be exposed to how these changes in business models are put into practice through specific features in the technology. Topics include platform competition, network effects, pricing models for digital goods, the sharing economy, the wisdom of crowds, the long-tail effect, the social network perspective, and technology adoption. (YR).
Prerequisite(s): ISM 310 or ITM 310 or MIS 310 or ACC 380

ISM 381  Info Systems Project Mgmt  3 Credit Hours
This course examines the management of information system projects in business organizations as well as human and organizational reactions to the changes brought about by new information systems. Topics include project planning, project controls, project reporting, information system projects and organizational changes, factors affecting project success and failure, and project management software.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 382  Advanced Computer Applications  3 Credit Hours
This is an advanced course in computer applications, decision modeling, and business problem-solving. Topics will include Visual Basic for Applications (VBA), pivot tables, user interfaces, and application manipulation techniques for both spreadsheet and database applications. Complex formulae will be introduced to enable students to create sophisticated models for solving nested and complex business problems. Credit cannot be given for ITM 382, ISM 382 and MIS 382.
Prerequisite(s): ITM 120 or ISM 120 or MIS 120 or (ITM 310 and ITM 311) or (ISM 310 and ISM 311) or MIS 310 or (ACC 380 and ACC 381)
Restriction(s):
Can enroll if Level is Undergraduate

ISM 383  Info Technology Security  3 Credit Hours
This course provides a foundation of IT security, methodologies, techniques, and tools. This course will cover both the managerial and technical sides of IT security. Topics include: security costs and benefits, information assets, security threats, network attacks, security planning, incident response, disaster recovery, and training. Hands-on lab sessions, interactive lectures, discussions, and guest speakers will be used throughout the course.
Prerequisite(s): ITM 310 or ISM 310 or MIS 310 or ACC 380

ISM 387  Digital Security  3 Credit Hours
Full Title: Digital Security: Threat Prevention and Management The ability to secure information within a modern enterprise-large or small-is a growing challenge. Threats to information security are global, persistent, and increasingly sophisticated. This course provides the practices and methods currently used by information security professionals to manage and secure an information environment. Topics includes security strategy and policies, security operation center (SOC), network security, physical security, malware countermeasures, operational systems security, risk analysis and incident response practices. (F,W,S)
Prerequisite(s): ITM 383 or ISM 383

ISM 431  Database Systems II  3 Credit Hours
This capstone course will provide an opportunity for students to work as a member of a project team on a complex, real-world information systems project. The course examines the processes and tools used to develop, implement and administer database systems in business. A class project involving the development of a database using a client/server database management system is performed. Project management methodologies and tools used to manage complex information systems projects are also applied in the course.
Prerequisite(s): ITM 321 or ISM 321 or MIS 321

ISM 491  Seminar: Manag Info Systems  3 Credit Hours
To provide students with an opportunity for intensive study in current areas related to the research activities and/or professional activities of faculty members. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
ISM 492 Research: Manag Info Systems 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business. Restriction(s): Can enroll if Class is Senior

Information Systems Security
Information Systems Security is a rapidly growing field which is very important to business and governmental organizations. Information security jobs, in both the private and public sectors, are growing at a very fast pace, based on bureau of labor statistics data. Information Systems professionals are increasingly being required to have exposure in information security.

Information Systems Security Minor
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<td>3</td>
</tr>
<tr>
<td>ISM 387</td>
<td>Digital Security</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 15

Management
The Management minor is not available to College of Business students. Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Management Minor
(not available to College of Business students)

Prerequisites
<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>MATH 104</td>
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<td>or MATH 105</td>
<td>Pre-Calculus</td>
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Minor Requirements
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<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
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</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
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<td>Behavior in Organization</td>
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</table>

Marketing
Marketing covers the creation of new products and services, the distribution of products from suppliers and manufacturers down to the final consumers, the pricing of products, as well as advertising, sales, and other promotional initiatives. The marketing major provides students an opportunity to develop skills for careers in marketing management, advertising, sales, marketing research, new product development, retailing, international business, purchasing, management of nonprofit organizations, and general business management. Their functional visibility enables high-achieving marketing persons to be aptly recognized, promoted, and compensated. Marketing is also an excellent major for students who are considering starting their own business. Majoring in digital marketing and marketing is not permitted.

Prerequisites for all courses must be met. Students not enrolled in the College of Business BBA program cannot elect more than 30 credit hours in courses offered by the College of Business.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

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Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
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- Lecture/Lab Science Course
- Additional Science Course

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Intersections (GEIN) – 6 Credits

Capstone

Capstone (GECE) – 3 Credits

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<tr>
<td>LE 253</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mkkg Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>40-41</td>
<td></td>
</tr>
</tbody>
</table>

Note: ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

Marketing Minor

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 352</td>
<td>Mkkg Principles and Policies</td>
<td>3</td>
</tr>
<tr>
<td>MKT 382</td>
<td>Understanding Customers</td>
<td>3</td>
</tr>
<tr>
<td>MKT 402</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>Select two courses from the following:</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>MKT 360</td>
<td>Marketing and Society</td>
<td></td>
</tr>
<tr>
<td>MKT 363</td>
<td>Digital Consumer Srch&amp;Mktg</td>
<td></td>
</tr>
<tr>
<td>MKT 434</td>
<td>Sales Mgmt &amp; Personal Selling</td>
<td></td>
</tr>
<tr>
<td>MKT 436</td>
<td>Business to Business Mktg</td>
<td></td>
</tr>
<tr>
<td>MKT 454</td>
<td>Marketing Research</td>
<td></td>
</tr>
<tr>
<td>MKT 455</td>
<td>E-tailing and Retailing</td>
<td></td>
</tr>
<tr>
<td>MKT 457</td>
<td>Glbl Mktng&amp;Consumr Cultre</td>
<td></td>
</tr>
<tr>
<td>MKT 458</td>
<td>Advertising</td>
<td></td>
</tr>
<tr>
<td>MKT 460</td>
<td>Digital Comm Strategy</td>
<td></td>
</tr>
<tr>
<td>MKT 471</td>
<td>Innovation, Entrepreneurship, and Creativity</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>15</td>
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</tbody>
</table>

MKT 352  Mkkg Principles and Policies  3 Credit Hours

An introductory course in the marketing activities associated with the free market system. The various components and functions of the marketing activities will be discussed in an integrated framework to provide insight into the role and scope of marketing in the business environment. The components and functions include: product development, pricing, promotion, distribution, consumer behavior and target market analysis.

Prerequisite(s): ECON 201 and ECON 202

Restriction(s):

Cannot enroll if Class is Freshman

MKT 360  Marketing and Society  3 Credit Hours

This course explores the social scientific theories on consumption and consumer culture as well as ethical/public policy issues related to consumption and marketing. Topics will include: economic and sociological perspectives on consumer culture; the origins of consumer tastes, trends, and fashions; the psychology of happiness and how personal well-being is influenced by wealth, consumption, and materialism; and public policy concerns related to marketing and advertising. (YR).

Restriction(s):

Can enroll if Class is Junior or Senior

Can enroll if Level is Undergraduate
MKT 363  Digital Consumer Srch&Mktg  3 Credit Hours
This course is dedicated exclusively to digital marketing issues. Topics include: keyword research; search engine optimization which covers (a) how to design websites and other digital assets so they are highly ranked by search engines, and (b) “off site optimization” which is establishing linking partners; and Pay per click advertising.
Prerequisite(s): MKT 352

MKT 382  Understanding Customers  3 Credit Hours
Students in this course will improve their ability to understand what customers want right now, what they are going to want in the future, and how to adjust the marketing mix to build lasting relationships with consumers. To do this, students will learn more advanced models of market segmentation, targeting, and product positioning. This course utilizes concepts developed in the behavioral sciences (economics, marketing, psychology, sociology, and anthropology) and qualitative research techniques to understand and predict consumer behavior, and enhance students’ ability to communicate effectively with target market segments.
Prerequisite(s): MKT 352

MKT 402  Marketing Management  3 Credit Hours
A case-oriented course in which the understanding and insights of the various components and functions of marketing learned in MKT 352 are applied to practical situations. Marketing decisions will be evaluated and decided for a series of real-life cases in a number of areas including: general marketing, pricing, promotion, distribution and market research.
Prerequisite(s): MKT 352

MKT 434  Sales Mgmt & Personal Selling  3 Credit Hours
The purpose of this course is to provide a general understanding of the practice of sales management. The course is designed to provide a basic framework of what sales managers actually do and how they solve problems they may encounter. Team presentations, case analyses and class discussion are used throughout the course to describe and explain the skills required of sales managers to achieve their objectives.
Prerequisite(s): MKT 352

MKT 436  Business to Business Mktg  3 Credit Hours
To develop an understanding of that area of marketing that addresses the needs of the organizational customer in industry, government and institutions. The special challenges of the industrial market that confront the marketing manager and sales personnel are discussed in the course. Topics include: assessing industrial marketing opportunities, the organizational buying process, formulating industrial marketing strategy and evaluating industrial marketing strategy and performance.
Prerequisite(s): MKT 352

MKT 454  Marketing Research  3 Credit Hours
To introduce marketing research concepts and techniques for collection, analysis and interpretation of data for marketing decisions. Topics include: problem definition, research design, questionnaire construction, sampling, attitude scaling, statistical analysis, presentation and evaluation of research findings. A field research project may be included.
Prerequisite(s): (DS 300 or DS 301) and MKT 352

MKT 455  E-tailing and Retailing  3 Credit Hours
This course introduces students to significant issues and analysis frameworks of 21st century retailing strategy and management, including retailing over the Internet, or “E-tailing.” E-tailing and retailers are challenged to enhance customer experience, customer service and customer satisfaction. The students will learn the complexities and nuances of shopper behavior, shopper demographics, and how shopper decisions are influenced by store design, store environment, store atmosphere and merchandising, in brick-and-mortar and Internet stores. The course will elevate and enhance students’ readiness and advancement in retail, brand management and marketing careers.
Prerequisite(s): MKT 352

MKT 456  Advg and Sales Promotion  3 Credit Hours
A survey of the principles of advertising and sales promotion, which examines problems related to advertising management. Topics include: the scope of the advertising business, determination of objectives, strategy formulation, creating effective advertising programs, media planning with emphasis on integrating new media into the mix, the role of dealers in promotion, establishing the advertising budget, advertising research and the social and legal aspects of advertising in society.
Prerequisite(s): MKT 352

MKT 457  Glbl Mrktng&Consumr Cultre  3 Credit Hours
To provide students with an understanding of the components of marketing in the international environment. A working knowledge of the environment and the complex inter-relationship between different components of marketing will be developed. The focus is on evolving a logical and integrated framework for international marketing decisions.
Prerequisite(s): MKT 352 and (ECON 2001 or (ECON 201 and ECON 202) or MKT 402)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

MKT 458  Advertising  3 Credit Hours
This course covers the principles of integrated brand advertising and promotion and digital strategies. Incorporated into this course are needed skills by both traditional and online marketing majors. Students will learn to allocate resources against a wide variety of communications and promotions vehicles, so as to effectively implement a brand strategy. We examine the current state of the business and problems related to advertising and promotion in the 21st Century. Topics include: determination of promotion objectives, strategy formulation, creating effective advertising programs, media planning, roles of client and agency, establishing the advertising budget, advertising research and the social and legal aspects of integrated brand promotion.
Prerequisite(s): MKT 352

MKT 460  Digital Comm Strategy  3 Credit Hours
This course is an in depth survey of the principles of digital advertising/communication and promotion. We examine the issues, particularly what is a brand today, the current state of the business and problems related to advertising and management in the 21st Century. Topics include the scope of the digital advertising business, determination of objectives, strategy formulation, creating effective digital advertising programs, media planning, roles of client and agency, establishing the advertising budget, advertising research and the social and legal aspects. (YR)
Prerequisite(s): MKT 352 and MKT 458


**MKT 463  Digital Analytics & Content Mkgt  3 Credit Hours**
This course is dedicated exclusively to digital marketing issues. Topics include: using digital analytics platforms to (a) understand the flow of traffic to your website and other digital assets, and (b) conversion design, i.e. creating websites and other digital assets that both attract visitors and effectively monetize those visits and working with web programmers, i.e. this topic provides students with basic vocabulary and concepts needed to work effectively with technical experts.

**Prerequisite(s):** MKT 363

**MKT 471  Entrepreneurial Marketing  3 Credit Hours**
This course applies the marketing mix: product development, pricing, promotion, and distribution to an entrepreneurial enterprise. It will explore marketing-related issues faced by entrepreneurs, such as: new product innovation, development, and testing; promoting the product with scarce resources and gaining market acceptance; raising capital, forecasting market demand, and projecting profit and loss; satisfying the many stakeholders, creating pricing strategies, and cultivating channels of distribution. This course aims to be a multidisciplinary seminar that requires students to explore a potentially profitable business idea and to develop an appropriate business plan. This interactive business laboratory will lead students from the assessment of their business idea to the definition of a detailed market research and the description of a trustable strategic planning. Finally, students will be also required to devise an accurate budget in order to give accounting consistency to the business idea described in the first part of their business plans. Topics covered include: market analysis, strategic planning and organizational structure, cost definition and analysis, break-even point, budgeting and performance representation.

**Prerequisite(s):** MKT 352

**MKT 488  Seminar: Marketing  1 to 3 Credit Hours**
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of School of Management.

**Restriction(s):**
- Can enroll if Class is Senior
- Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Small Business Management**

The small business management major is designed to offer students a broad range of knowledge and skills in order to prepare them to lead or contribute to a small or medium enterprise. Small businesses present unique opportunities and challenges, which students in this major will be equipped to navigate. In addition to learning about diverse business disciplines, students will be exposed to the fundamental processes of starting and managing a small business.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)
Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Business Administration Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 300</td>
<td>Career Planning &amp; Develop</td>
<td>1</td>
</tr>
<tr>
<td>BA 320</td>
<td>Proj Mgmt &amp; Leadership Skills</td>
<td>3</td>
</tr>
<tr>
<td>BA 330</td>
<td>Managerial Communication</td>
<td>3</td>
</tr>
<tr>
<td>BA 400</td>
<td>Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>BE 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 451</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 302</td>
<td>Advanced Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 401</td>
<td>Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 380 &amp; ACC 381</td>
<td>Accounting Information Systems and Accounting Info Sys Lab</td>
<td>3</td>
</tr>
<tr>
<td>LE 253</td>
<td>Business Law</td>
<td>3</td>
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</tr>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following: 3-4

| ISM 310 | Info Systems in Management         | 3 |
| ACC 380 & ACC 381 | Accounting Information Systems and Accounting Info Sys Lab | 3 |
| LE 253 | Business Law                       | 3 |
| MKT 352| Mktg Principles and Policies       | 3 |
| OB 354 | Behavior in Organization           | 3 |
| OM 300 | Intro to Operations Management     | 3 |

Total Credit Hours 40-41

1 Note: ACC 380/ACC 381 is a requirement for students pursuing an Accounting major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>
| Required
| ACC 357 | Intermediate Financial Acct 2     | 3            |
| or ACC 358 | Financial Reporting               | 3            |

Supply Chain Management

The major in Supply Chain Management provides students with opportunities for careers in e-business, startups, manufacturing, high tech, service and consulting companies. Supply Chain Management encompasses a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses and stores so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying service level requirements. SCM is an interdisciplinary field that emphasizes cross-functional links and seeks to manage those links to enhance a company’s competitive advantage.

Prerequisites for all courses must be met. Students not enrolled in the College of Business major. Finance majors may elect either ISM 310 or ACC 380/381. All other majors must elect ISM 310.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece) section for additional information.

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Areas of Inquiry

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Business Administration Core

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</tr>
<tr>
<td>Select one of the following:</td>
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<td>3-4</td>
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<tr>
<td>ISM 310</td>
<td>Info Systems in Management</td>
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<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
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<tr>
<td>Select two courses from the following:</td>
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<tr>
<td>DS 310</td>
<td>Data Mining for Bus Intel</td>
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<tr>
<td>HRM 305</td>
<td>Human Resource Policy/Admin</td>
<td>3</td>
</tr>
<tr>
<td>ISM 382</td>
<td>Advanced Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>MKT 436</td>
<td>Business to Business Mktg</td>
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</tr>
<tr>
<td>OM 493</td>
<td>Research:Operations Management</td>
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</table>

Total Credit Hours 21

Supply Chain Management Minor

Prerequisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
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<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
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Minor Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>OM 300</td>
<td>Intro to Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>OM 460</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>Select three courses from the following:</td>
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<tr>
<td>OM 465</td>
<td>Strategic Sourcing</td>
<td>3</td>
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<tr>
<td>OM 470</td>
<td>Analys &amp; Design of Supply Chain</td>
<td>3</td>
</tr>
<tr>
<td>OM 475</td>
<td>Supply Chain Logistics Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>OM 480</td>
<td>ERP in SCM</td>
<td>3</td>
</tr>
<tr>
<td>OM 493</td>
<td>Research:Operations Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 15

OM 300  Intro to Operations Management  3 Credit Hours
Concerned with the strategic, tactical and short-term managerial issues relating to the efficient production of services and products. Examples of such issues are: manufacturing technology selection, facility location, strategic, tactical and operational planning and control and quality.
(F.W.S)

Prerequisite(s): MATH 104 or MATH 105 or MATH 113 or MATH 115 or Mathematics Placement with a score of 115

Restriction(s):
Cannot enroll if Class is Freshman

OM 460  Supply Chain Management  3 Credit Hours
This course explores the basic concepts of managing flow of materials in a typical enterprise supply chain. Students will examine a complete overview of material flow, for internal and external suppliers, to and from the enterprise.

Prerequisite(s): OM 300 or OM 400

Restriction(s):
Can enroll if Level is Undergraduate

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>OM 460</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>OM 465</td>
<td>Strategic Sourcing</td>
<td>3</td>
</tr>
</tbody>
</table>
OM 465  Strategic Sourcing  3 Credit Hours
This course provides an in-depth analysis of the procurement process and supplier management with strong analysis placed on managing a supplier base for both products and services. Both theoretical and quantitative perspectives will be offered. In addition, topics will be addressed from strategic, financial and global perspectives.
Prerequisite(s):  OM 300 or OM 400
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

OM 470  Analys & Design of Supply Chain  3 Credit Hours
The purpose of this course is to equip the student with the ability and the tools necessary to recognize, analyze, and resolve significant problems in the operation of a supply chain system through the application of quantitative techniques. This course focuses on the strategic role of the supply chain, key strategic drivers of supply chain performance, and the tools and techniques for supply chain analysis.
Prerequisite(s):  OM 300 or OM 400
Restriction(s):
Can enroll if Level is Undergraduate

OM 475  Supply Chain Logistics Mgmt  3 Credit Hours
The overarching course objective is to develop an in-depth understanding of integrative managerial issues and challenges related to developing and implementing a firm's logistics strategy. Attention is directed to the logistical mission confronted by varied types of business organizations. Logistics is positioned as a value-adding process that achieves time and place synchronization of demand stimulation and operations fulfillment. Emphasis will be placed on challenges related to providing logistical support for procurement, manufacturing and market-distribution.
Prerequisite(s):  OM 300 or OM 400
Restriction(s):
Can enroll if Level is Undergraduate

OM 480  ERP in SCM  3 Credit Hours
This course provides in-depth coverage of the role and impact of enterprise resource planning (ERP) concepts in managing a supply chain. The design of a supply chain information system (SCIS) and its various components is explored utilizing ERP concepts in matching supply and demand through the implementation of an integrated enterprise. Both theory and applications are emphasized in the course. Hands-on experience in the development of some components of SCIS utilizing ERP systems is provided.
Prerequisite(s):  (OM 300 or OM 400) and (ITM 310 or MIS 310)
Restriction(s):
Can enroll if Class is Freshman or Sophomore or Junior or Senior

OM 483  Seminar: Operations Management  1 to 3 Credit Hours
To provide students with an opportunity for intensive study in current selected areas related to the research activities and/or professional activities of faculty members. Permission of School of Management.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

OM 493  Research: Operations Management  1 to 3 Credit Hours
To provide the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the term when such a course is to be elected, an interested student must submit to the dean of the school a written request for permission to elect a research course, on a form available in the school office. The request will include a description of the proposed research project. The dean will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Permission of College of Business.
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Business

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

College of Education, Health, and Human Services

Our Work: Education, Health, and the Human Services

The College of Education, Health, and Human Services aims to prepare and sustain exemplary practitioners and administrators for work in the interrelated fields of education, human health, and human services through an emphasis on scholarship, diversity, inclusion, and excellence in service delivery.

The College draws broadly upon institutional resources including faculty and programs in other colleges of the University. Additionally, facilities in local school districts, health-related settings, public agencies and private corporations regularly provide students with a spectrum of rich experiences.

The College contributes to the University of Michigan-Dearborn’s impact as a dynamic metropolitan university in which teaching and research interact to develop leaders and new knowledge in the tradition of the University of Michigan. Students in CEHHS have the opportunity to participate in many organizations within the College, campus, and community.

History of the College

Shortly after UM-Dearborn opened in 1959, a small teacher certification program was added to the liberal arts division. By 1969 the teacher certification program had grown into one of the largest academic departments on the campus. During 2012-13, the Regents of the University of Michigan authorized the addition of the Department of Health and Human Services (HHHS), and the creation of the College of Education, Health, and Human Services (CEHHS).

Undergraduate Degree Programs

At the College of Education, Health, and Human Services (CEHHS), our undergraduate programs help develop the skills and experiences to both transform your life and make a difference in your community.
With a wide variety of undergraduate programs including, Bachelor of Arts, Bachelor of Science, Bachelor of General Studies, minors, and certificates. Whether preparing for careers in child life, public health, social work, or medicine or focused on education with degrees such as Instructional Technology, Children and Families, or teacher certification, students have the opportunity to select the ways in which they hope to improve their world.

For a listing of undergraduate offerings and opportunities, see our Undergraduate Programs page (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/).

Details regarding any of the programs can be found in later sections of this Undergraduate Catalog.

Admission to the College of Education, Health, and Human Services

Come join the College of Education, Health, and Human Services, and be a part of transforming our region, community, and world. Whether you are just starting your undergraduate experience, or are transferring to join us, contact a CEHHS advisor for a prospective student appointment (https://umdearborn.edu/cehhs/cehhs-office-student-success/academic-advising/undergraduate-advising/), schedule a visit, and make a difference at CEHHS.

- Admission of Freshman Students (https://umdearborn.edu/admissions/undergraduate/incoming-freshmen/)
- Admission of Transfer Students (https://umdearborn.edu/admissions/undergraduate/transfer-students/)
- Admission of Post-Degree Students (https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/)

Office of Student Success

The Office of Student Success for the College of Education, Health, and Human Services is located in 262 FCS. All matters relating to CEHHS student needs including academic advising, pre-health professions advising, field placement, teacher certification, and student records and forms are handled here. To schedule an advising appointment or for more information, the Office of Student Success can be reached at 313-593-5090.

Academic Advising (https://umdearborn.edu/cehhs/cehhs-office-student-success/academic-advising/undergraduate-advising/)

The College has professional Academic Advisors that specialize in CEHHS programs and can help students navigate their coursework and requirements from beginning to end. Students are encouraged to meet with an Academic Advisor at least once a semester to support student success and progress.

Field Placement

Field placements allow for each learner to build skills, knowledge, and confidence in his/her own pathway toward becoming a professional in real world placements. All required clearances, paperwork, and placements for field assignments are handled within the CEHHS Office of Student Success.

Department of Education

Education is not one career; it is many. Individuals specializing in education are qualified to pursue a wide variety of attractive and rewarding professions including teaching, corporate training, recreation, social service, and childcare. Wherever there is a need for people specifically prepared to teach others, there is a need for individuals with a background in education.

Still, most college graduates seeking a career in education elect to become classroom teachers. Teaching offers a wide choice of opportunities to work with persons of different age levels in a variety of specialized fields. It is a satisfying career for those who like to inspire growth in others and continue their own development.

Students admitted to any of the education programs offered at UM-Dearborn are provided with an academic and professional background suited to the challenges of education in a multicultural society. For further information, please visit the College of Education, Health, and Human Services website at http://umdearborn.edu/cehhs/ (http://www.umdearborn.edu/cehhs/).

Accreditation (https://umdearborn.edu/cehhs/departments/education/about/accreditation/)

The University of Michigan-Dearborn Teacher Certification program is designed to produce graduates who are knowledgeable in their content areas and their use of pedagogy with diverse learners and who are prepared to become caring and reflective professionals. The Michigan Department of Education approval enables the College to offer programs and make recommendations resulting in state-issued certification of teachers and administrators. Additionally, certification is accredited by the Teacher Education Accreditation Council (TEAC), a subsidiary of the Council for the Accreditation of Educator Preparation (CAEP). This accreditation certifies that the program has provided evidence that it adheres to TEAC's quality principles. The Early Childhood Education Center is accredited by the National Association for the Education of Young Children (NAEYC).

Department of Health and Human Services

The Department of Health and Human Services (HHS) prepares leaders, professionals, and scholars to improve the health and welfare of persons and communities in local, national, and global settings. HHS provides an innovative academic environment for students interested in improving the lives and health of vulnerable populations. HHS faculty enhance student learning by connecting classroom instruction with ongoing intervention research, meaningful field experiences and community outreach efforts. Students complete a rigorous interdisciplinary program of study and master valuable professional skills. HHS students are well prepared to launch their careers or pursue additional graduate training to help solve pressing problems and deliver exceptional health and human services.

Course Offerings

Courses offered by the College of Education, Health, and Human Services are numbered following the general course numbering system. Courses numbered 100–299 are lower-division courses. Courses numbered 300–499 are undergraduate upper-division courses. Courses numbered 500 and above are graduate courses.
Each education course also carries an alphabetical letter designation. This designation reflects the course’s location in the subject-matter classification system used by the College of Education, Health, and Human Services.

<table>
<thead>
<tr>
<th>Letter Designation</th>
<th>Subject Matter Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA</td>
<td>Theoretical Foundations</td>
</tr>
<tr>
<td>EDB</td>
<td>Administration/Issues</td>
</tr>
<tr>
<td>EDC</td>
<td>Psychological Foundations</td>
</tr>
<tr>
<td>EDD</td>
<td>Curriculum and Instruction</td>
</tr>
<tr>
<td>EDF</td>
<td>Health and Physical Education</td>
</tr>
<tr>
<td>EDK</td>
<td>Research and Independent Study</td>
</tr>
<tr>
<td>EDM</td>
<td>Multicultural/Community Education</td>
</tr>
<tr>
<td>EDN</td>
<td>Special Education</td>
</tr>
<tr>
<td>EDT</td>
<td>Education Technology</td>
</tr>
<tr>
<td>EXPS</td>
<td>Exploratory Studies</td>
</tr>
<tr>
<td>HHS</td>
<td>Health and Human Studies</td>
</tr>
<tr>
<td>HIT</td>
<td>Health Information Technology</td>
</tr>
<tr>
<td>LIBR</td>
<td>Library Science</td>
</tr>
<tr>
<td>PDED</td>
<td>Professional Education</td>
</tr>
</tbody>
</table>

**Majors**
- Children & Families (p. 535)
- Educational Studies (p. 538)
- Early Childhood (p. 536)
- Elementary Teacher Certification Program (p. 539)
- Health and Human Services (p. 554)
- Instructional Technology (p. 564)
- Language Arts (p. 567)
- Mathematics Studies (p. 568)
- Reading
- Secondary Teacher Certification Program (p. 576)
- Science Studies (p. 574)
- Social Studies (p. 595)
- Special Education (p. 597)

**Minors**
- Health Policy Studies (p. 564)
- Public Health (p. 572)
- Social Work (p. 596)

**Certificates**
- Applied Behavior Analysis Certificate (p. 534)
- Child Life Assistant (p. 535)
- K-8 STEM2 Teaching (p. 566)
- Pre-Professional Health Studies (p. 572)
- Social Services Technician (p. 594)
- STEM2: Multidisciplinary (p. 598)
- Teaching English to Speakers of (p. 599) other (p. 599) Languages (p. 599)

**Post-Degree Programs**
- Certification Only Program (Elementary-COE, Secondary-COS (p. 570))
- Professional Education Certificate Program (PEC) (p. 570)
- Enhancement Program (EP) (p. 570)
- Endorsement Programs (Early Childhood (ZS) and English as a Second Language (NS) (p. 570)

**Administration**
- Ann Lampkin-Williams, PhD, Dean
- Stein Brunvand, PhD, Associate Dean
- Paul Bielich, MLS, Instructional Learning Manager
- Monique Davis, Assistant to the Dean
- Rachel Fortune, MA, Field Placement Coordinator
- Judy Garfield, Administrative Assistant Senior, Dept. of Education and Health and Human Services
- Sharon Harris, Administrative Assistant, Dean's Suite
- Donna Kerry, MA, Certification Officer
- Jonathan Larson, MA, Assistant Director of Advising
- Claudia Lugo-Meeks, MEd, Instructional Learning Assistant
- Amanda McBride, Program Assistant
- Elizabeth Morden, Program Assistant
- Lindsey Bookman, MA, Director of Advising and Records

**Chairs and Directors**
- Christopher J. Burke, Director, EdD, EdS Program
- Danielle DeFauw, Director, Field Placement
- Susan A. Everett, Chair, Education
- Paul Fossum, Director, Masters Degree Programs
- Patricia A. Wren, Chair, Health and Human Services

**Professors Emeriti**
- Adler, Martha A., PhD, University of Michigan, Associate Professor Emeritus of Education
- Cepuran, Joseph, PhD, Associate Professor Emeritus of Public Administration
- Collin, Claudia, PhD, Assistant Professor Emerita of Education
- Kachaturoff, Grace, EdD, Professor Emerita of Education
- Kettel, Raymond P., EdD, Associate Professor Emeritus of Education
- Lazarus, Belinda, PhD, Professor Emerita of Education
- Lipson, Greta B., EdD, Associate Professor Emerita of Education
- Moyer, Richard, EdD, Professor Emeritus of Science Education
- Otto, Charlotte, PhD, Professor Emerita of Chemistry and Education
Poster, John, PhD, Professor Emeritus of Public Administration and Education
Romatowski, Jane A., EdD, Professor Emerita of Education
Saltz, Rosalyn, PhD, Professor Emerita of Education
Sayles, Daniel G., PhD, Associate Professor Emeritus of Education
Trepanier-Street, Mary, EdD, Professor Emerita of Education
Van Tiem, Darlene, PhD, Associate Professor Emerita of Education
Verhey, Roger, PhD, Professor Emeritus of Education

Faculty

Department of Education

Beyer, Bonnie M., EdD, Vanderbilt University, Professor of Education and Educational Administration
Bock Hong, Seong, EdD, University of Massachusetts Amherst, Professor of Education
Brunvand, Stein, PhD, University of Michigan, Professor of Educational Technology
Burke, Christopher J., PhD, University of Illinois at Urbana-Champaign, Associate Professor of Science Education
DeFauw, Danielle, PhD, Oakland University, Associate Professor of Education
Duran, Mesut, PhD, Ohio University, Professor of Education
Everett, Susan A., PhD, University of Iowa, Professor of Science Education
Fossum, Paul, PhD, University of Minnesota, Professor of Education
Hill, David, PhD, University of Pittsburgh, Assistant Professor of Education
Hill, Kirsten, PhD, Michigan State University, Associate Professor of Education
Killu, Kim, PhD, Ohio State University, Professor of Education
Luer, Gail R., PhD, University of Michigan, Professor of Education
Park, Kyongsun, PhD, Purdue University, Assistant Professor of Education
Shaffer, LaShorage, PhD, University of Illinois at Urbana-Champaign, Associate Professor of Education
Taylor, Julie, PhD, University of Cambridge, Professor of Education
Thomas-Brown, Karen, PhD, University of the West Indies, Associate Professor of Education

Department of Health and Human Services

Botoseneanu, Anda, PhD, University of Michigan, Associate Professor of Health Policy Studies
Martin, Lisa, PhD, University of Michigan, Associate Professor of Health Policy Studies and Women's and Gender Studies
Polenco-Lopez, Jean-Carlos, PhD, University of Florida, Assistant Professor of Health and Human Services
Sampson, Natalie, PhD, University of Michigan, Assistant Professor of Public Health
Wren, Patricia A., PhD, University of Michigan, Professor of Health and Human Services

Cooperating Faculty

Cengiz-Phippils, Nesrin, PhD, Associate Professor of Mathematics Education
Krebs, Angela, PhD, Associate Professor of Mathematics Education
Martinez-Valencia, Francis Eliana, PhD, University of Alabama, Associate Professor Spanish
Nesmith, Judy, MS, Senior Lecturer of Natural Sciences
Rathouz, Margaret, PhD, Associate Professor of Mathematics Education
Shelly, Michael, EdD, Lecturer of Mathematics Education

Special Facilities and Services

The College of Education, Health, and Human Services is recognized for its concentrated focus in several areas. This concentrated focus is designed to marshal available expertise at the institution in pursuit of regional needs and goals in several particular emphasis areas, including early childhood learning and instruction and inquiry-based science instruction.

- Curriculum Knowledge Center (CKC) (https://umdearborn.edu/cehhs/centers-institutes/curriculum-knowledge-center-ckc/)
- Early Childhood Education Center (https://umdearborn.edu/cehhs/centers-institutes/eececc/)
- The Inquiry Institute (https://umdearborn.edu/cehhs/centers-institutes/inquiry-institute/)

Applied Behavior Analysis Certificate

Designed for students interested in working with individuals with intensive behavioral needs including those with Autism Spectrum Disorder. School systems, corporations, law enforcement agencies, and behavioral health providers hire Behavior Analysts to develop policies and procedures and work directly with individuals to improve educational and health outcomes and behavior challenges. Certificate coursework prepares students to sit for the Board Certified Assistant Behavioral Analyst examination: http://bacb.com

For more information: 313-593-5090
www.umdearborn.edu/cehhs

Certificate Program Goals

After completion of the certificate courses, the student will:

1. Describe and provide examples of the critical concepts and principles of Applied Behavior Analysis (ABA);
2. Describe and apply research methodology and measurement strategies used in the implementation and management of ABA;
3. Describe and apply the principles of ABA in relation to individuals with a variety of disabilities in a range of clinical, educational, pre-vocational/vocational, home and community settings;
4. Describe and apply behavioral assessment procedures, including identification of target behaviors, developing operational definitions, conducting functional behavior assessment/functional analysis;

5. Accurately graph, visually analyze and interpret behavioral data, including functional analysis data;

6. Describe ethical issues related to ABA service delivery with individuals with developmental disabilities and other mental health needs;

7. Describe and apply principles of experimental design including single-subject research methodology; and

8. Develop Behavior Intervention Plans based upon the results of functional analysis.

To view application forms and additional program information, please click here (https://umdearborn.edu/cehhs/professional-development-training/certificates/undergraduate-certificate-programs/).

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 306</td>
<td>Applied Behavior Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>EDC 307</td>
<td>Applied Behavior Analysis II</td>
<td>3</td>
</tr>
<tr>
<td>EDC 308</td>
<td>Intro Dev Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>EDC 310</td>
<td>RBT Training</td>
<td>3</td>
</tr>
<tr>
<td>EDC 350</td>
<td>Intro to Ethics for ABA</td>
<td>1</td>
</tr>
<tr>
<td>EDC 402</td>
<td>Research Methods Beh Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EDC 471</td>
<td>Prog Impl, Super, &amp; Management</td>
<td>3</td>
</tr>
<tr>
<td>EDC 480</td>
<td>Behavioral Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 22

**Child Life Assistant Specialty Courses (6 credit hours - Choose two courses from the following)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS 401</td>
<td>Hospitalized Child</td>
<td>3</td>
</tr>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 440</td>
<td>The Child: Birth to Three</td>
<td>3</td>
</tr>
<tr>
<td>EDC 439</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>HPS 442</td>
<td>Medical Ethics</td>
<td>3</td>
</tr>
<tr>
<td>SWK 300</td>
<td>Theories and Practices</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 6

**Additional Job-Ready Courses and Experiences (The following are optional choices that can assist students in preparing for professional CLS assistant employment; could include 1-4 credit hours)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 402</td>
<td>Internship CHE</td>
<td>3</td>
</tr>
<tr>
<td>PDED 418AM</td>
<td>Registered Behavior Technician Training</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Crisis Prevention Institute Training (CPI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basic First Aid - Red Cross</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPR / AED Training</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mental Health First Aid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bloodborne Pathogens Certification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Background Check and Fingerprinting</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 1-4

**Children and Families**

This bachelor’s degree empowers you to become a strong, skilled advocate for children and families, by developing both a deep understanding of child development and the challenges children and families face within today’s diverse socio-economic and cultural contexts.
After you complete your studies, you can put your passion and expertise to use in a variety of settings. Our graduates work as educators in Head Start and childcare centers, serve as teachers or administrators in programs designed for young children, and help power agencies that advocate for young people and families.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Children and Families Course Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDC 412</td>
<td>Social Devl/Pos Guidance Techn</td>
<td>3</td>
</tr>
<tr>
<td>EDC 414</td>
<td>Early Child Ed Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>EDC 439</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>EDC 442</td>
<td>EC: Fam/Sch/Comm Collaboration</td>
<td>3</td>
</tr>
<tr>
<td>EDB 422</td>
<td>Lead,Advoc, Admin Early Ch Prg</td>
<td>3</td>
</tr>
<tr>
<td>HHS 210</td>
<td>Intro to Social Work</td>
<td>3</td>
</tr>
<tr>
<td>HHS 305</td>
<td>Introduction to Play</td>
<td>3</td>
</tr>
<tr>
<td>HHS 310</td>
<td>System of Care</td>
<td>3</td>
</tr>
<tr>
<td>HHS 312</td>
<td>Family Preservation &amp; Recovery</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours</td>
<td>31</td>
</tr>
</tbody>
</table>

Students have the option of selecting one of two concentrations in the program. The Child Studies concentration is designed to prepare individuals who want to work in early childhood while the Social Agency concentration is for students who want to work with a range of community centered agencies that provide services to children and families.

**Child Studies Concentration**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDD 406</td>
<td>Teach Strategies Early Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 410</td>
<td>Practicum in Early Child Ed</td>
<td>1</td>
</tr>
<tr>
<td>EDD 411</td>
<td>Directed Tchg: Early Childhood</td>
<td>4</td>
</tr>
<tr>
<td>EDD 412</td>
<td>Seminar in Early Childhood Ed</td>
<td>2</td>
</tr>
<tr>
<td>EDD 446</td>
<td>Intervention Strat EC Spec Ed</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours</td>
<td>16</td>
</tr>
</tbody>
</table>

**Social Agency Concentration**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHS 350</td>
<td>Comm Organizing for Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 407</td>
<td>Fundraising &amp; Grantwriting</td>
<td>3</td>
</tr>
<tr>
<td>HHS 425</td>
<td>Work w/Child in Health Setting</td>
<td>3</td>
</tr>
<tr>
<td>EDD 418</td>
<td>Children and Families Intern</td>
<td>4</td>
</tr>
<tr>
<td>SOC 200</td>
<td>Understanding Society</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours</td>
<td>16</td>
</tr>
</tbody>
</table>

**Early Childhood**

The Early Childhood Education Program is designed for those intending to work with children, birth through eight years of age. Within the basic elementary education degree curriculum, it enables students to meet State requirements for a Michigan Elementary Standard Teaching Certificate and the Early Childhood Endorsement (ZS) as well as to gain special competencies in the area of early childhood. It prepares individuals for careers in childcare centers, working with young children and their families, birth through kindergarten, as well as in the elementary
grades 1-5. The program includes a concentrated study of the young child in infant/toddler, preschool, and early school contexts with extensive opportunities for field experiences in a variety of settings.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gsb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Core Course Requirements**

Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.

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**Pre-Professional Requirements**

Pre-professional courses are generally completed in the freshman and sophomore year.

**Major Requirements**

A minimum of 34 semester hours from the following:
The Bachelor of Arts in Educational Studies prepares students to understand the field of education without focusing on teacher certification requirements. This degree program will be beneficial to students who are seeking jobs in non-school settings and want to deepen their understanding about teaching and learning. For example, many community organizations and non-profits work closely with schools and the education of children and adolescents. Other students may be interested in a degree in education that will provide a strong background for a graduate degree in fields such as social work or public administration.

The undergraduate major of Educational Studies will provide a foundation for students in three areas: learners and learning, educational systems, and pedagogy. The major will NOT lead to teacher certification; it is designed to be applicable to anyone interested in learning more about how people learn and how to use the foundational knowledge of education in a variety of different work environments.

For those interested in PK-12 teacher certification, please refer to The Elementary (K-8) Certification program (https://umdearborn.edu/cehhs/cehhs_elem_cert/) or the Secondary (6-12) Certification program (https://umdearborn.edu/cehhs/cehhs_secondary_cert/).

Program Goals
Bachelor of Arts in Educational Studies graduates will:

1. Acquire knowledge of educational systems
2. Understand how students develop and learn
3. Recognize and value diversity within an educational setting
4. Make informed decisions about learning based on assessment

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gedc) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 414</td>
<td>Early Child Ed Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>EDC 439</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>EDC 442</td>
<td>EC: Fam/Sch/Comm Collaboration</td>
<td>3</td>
</tr>
<tr>
<td>EDC 445</td>
<td>Develop Assess of Young Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 406</td>
<td>Teach Strategies Early Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 410</td>
<td>Practicum in Early Child Ed</td>
<td>1</td>
</tr>
<tr>
<td>EDD 411</td>
<td>Directed Tchg: Early Childhood</td>
<td>4</td>
</tr>
<tr>
<td>EDD 412</td>
<td>Seminar in Early Childhood Ed</td>
<td>2</td>
</tr>
<tr>
<td>EDC 431</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 440</td>
<td>The Child: Birth to Three</td>
<td>3</td>
</tr>
<tr>
<td>EDD 446</td>
<td>Intervention Strat EC Spec Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDC 446</td>
<td>Cog/Memory Dev in Children</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 34

Major Notes:

1. With the approval of the Early Childhood Program Coordinator, a maximum of six credit hours of freshman and sophomore level transfer courses in early childhood will be considered for general credit toward the early childhood major.
2. An overall GPA of 2.75 or better is required for the major.
3. At least 15 semester hours in UM-Dearborn courses required for a major.
4. A grade of S is required in EDD 411.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. The minimum number of semester hours required to graduate is 128.
7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
8. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details.
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Prerequisites (6 Cr. Hrs.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 205</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
</tbody>
</table>

Major (39 Cr. Hrs.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 400</td>
<td>Adult Learning:Theory/Practice</td>
<td>3</td>
</tr>
<tr>
<td>EDC 431</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 446</td>
<td>Cog/Memory Dev in Children</td>
<td>3</td>
</tr>
<tr>
<td>EDC 456</td>
<td>Learning &amp; Classrm Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDT 420</td>
<td>Intro Teaching Learning Online</td>
<td>3</td>
</tr>
</tbody>
</table>

Learners and Learning (18 Cr. Hrs.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
<tr>
<td>PDED 405</td>
<td>Sp Ed Legisln and Litigation</td>
<td>3</td>
</tr>
</tbody>
</table>

Pedagogy Electives: Choose from the following courses (12 Cr. Hrs.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>EDC 439</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>EDD 447</td>
<td>Tchng English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 474</td>
<td>Environmental Education</td>
<td>3</td>
</tr>
<tr>
<td>EDT 414</td>
<td>Application ofInstrl Design</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 400</td>
<td>STEM2 Teaching and Learning</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives (44 Cr. Hrs.)

Total credit hours needed for graduation: 120

Elementary Teacher Certification Program

This program was designed for students to meet the requirements for both a bachelor's degree and the Michigan Elementary Standard Teaching Certificate. Completers of this program will be eligible to teach K-5th grade in a self-contained classroom and subject specific courses in 6-8th grade depending on the major selected. The curriculum consists of two parts, the first involving academic study, and the second consisting of professional preparation, including passing scores on the Michigan Test for Teacher Certification (MTTC) Elementary Education exam, prior to student teaching.

Certification

The College of Education, Health and Human Services recommends students for the Michigan Elementary Standard Teaching Certificate upon successful completion of the program. The Michigan Department of Education ultimately awards the certification.

Elementary Standard Teaching Certificates

The initial teaching certificate awarded the beginning elementary school teacher is the Michigan Elementary Standard Teaching Certificate. This certificate is valid for teaching all subjects in kindergarten through fifth grade and subject specific classes 6-8th grade if an endorsement is obtained. Students are able to obtain endorsements by completing the course work in a major and optional minor and successfully passing the Michigan Test for Teacher Certification (MTTC) in their content area. Students who complete the Special Education major and pass the corresponding MTTC are eligible to teach in a resource room K-12th grade. The Standard Teaching Certificate is valid for five years and can be renewed an unlimited number of times provided that renewal conditions are met. Legislative or other state action may change these specifications. Therefore, students are advised to contact the College of Education, Health, and Human Services’ Office of Student Success, located in room 262 Fairlane Center South (FCS), to learn of the most recent policies.

General Requirements for a Teacher's Certificate

In order to be awarded an elementary or secondary Standard Teaching Certificate, students at UM-Dearborn must be recommended for the certificate by the Governing Faculty of the College of Education, Health, and Human Services. The general procedure to be followed in obtaining such a recommendation is outlined below. It should be noted, however, that progression from one step to another is not automatic; students are expected to be individually responsible for understanding and meeting the requirements and provisions of the programs they pursue.

Qualifying for a Standard Teaching Certificate

To qualify for certificate recommendation, an individual must fulfill the following requirements:

1. Earn a bachelor’s degree from UM-Dearborn or another accredited institution with an overall GPA of 2.75; a minimum GPA of 2.75 in the major; a minimum GPA of 2.75 in an optional minor; and a minimum GPA of 2.75 in the Professional Studies Sequence. Irrespective of where the degree is earned, each candidate shall satisfactorily complete directed teaching and all required methods courses and practica at UM-Dearborn.

2. If acquiring both the bachelor’s degree and a teacher’s certificate from UM-Dearborn, the individual shall complete the degree with the appropriate number of semester hours depending on the program selected.
3. Comply with the Four-Phase Checklist described below.
4. Meet all Michigan Department of Education Teacher Certificate requirements including state mandated tests.
5. Satisfy the College faculty that the applicant possesses attributes that are necessary and desirable for successful teaching.

**Professional Semester/Directed Teaching (Student Teaching)**

Each student enrolled in a teacher certification program at UM-Dearborn, whether pursuing an elementary or a secondary Standard Teaching Certificate, is expected to spend one full academic term exclusively in professional work. This period of time is called the "professional semester." Directed Teaching (student teaching) and its related seminar serve as the core for this particular term. This entails a full day’s teaching load and all school-related activities at a University-negotiated site. The professional semester for elementary certification students is as follows:

**Elementary Professional Semester**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Opportunities for directed teaching are available only in the University’s fall and winter terms. Students wishing to elect directed teaching in the fall term are required to attend an application meeting the preceding September and those desiring to elect it during the winter term are required to attend an application meeting the preceding March. Meeting dates, times, and locations will be posted on the Field Placement Office website and in the Fairlane Center South. Requirements for acceptance into the professional semester are outlined in the Four-Phase Checklist.

**Incompletes, Unsatisfactory Grades, and Withdrawals**

No student will be assigned to, or registered for, directed teaching with incomplete work in the Professional Sequence of courses. Moreover, once a student has been assigned to a directed teaching placement and then has had registration denied because of incomplete work, the student will be prohibited from receiving any future directed teaching assignment for that semester.

Any student, who has withdrawn from or received an unsatisfactory grade in directed teaching, whether through the action of a school district, the University, or by personal choice, will have a request for future placement carefully reviewed by the College’s Executive Committee. Reassignment to directed teaching is not guaranteed, nor is it an automatic process.

Students must file petitions for reassignment consideration.

**General Field Placement Policy**

Students in the teacher preparation program are assigned field placements, either as practicum students or as student teachers, in public or private schools. Field placement shall be made in accordance with the policies and procedures set forth by the College of Education, Health, and Human Services and in compliance with accreditation standards.

The student is expected to maintain a professional attitude in order to conform to the expectations of the placement school and the University. Appropriate academic preparation is required as outlined in the elementary and secondary programs of the College. Professional responsibilities during the Directed Teaching term are detailed in the "UM-Dearborn Directed Teaching Handbook" which is located on the CEHHS Field Placement website.

The public and private schools exercise the right to screen the University’s students. Acceptance or rejection of students is not controlled by the University. A placement school may reject a University student for several reasons, including a lack of placement positions in the school or a determination that the University student’s presence in the school or classroom may disrupt or interfere in some way with the educational process.

Currently there is no way in which the University can require the placement school to state specific reasons for rejection.

If a University student is repeatedly denied placement by the field schools, the College of Education, Health, and Human Services will recommend career counseling and terminate matriculation in the teacher certification program.

**College of Education, Health, and Human Services Four-Phase Checklist**

The College of Education, Health, and Human Services (CEHHS) at the UM-Dearborn is committed to the ideal of quality in the field of teacher education. A screening procedure is employed to help identify those people most likely to achieve the level of excellence defined by the college. This screening procedure is divided into four successive phases. **Requirements at one phase must be successfully completed before continuing on to the next.** Students are also responsible for meeting all program requirements for their selected degree as listed in Degree Works.

**Phase One - Initial Admission to Education**

*All requirements listed below must be completed for progression to Phase Two:*

1. Three types of students are considered for admission to the College of Education, Health, and Human Services at this entry level phase:
   - First time in any college (FTIAC) students - Campus admission standards for SAT, ACT, and high school Grade Point Average (GPA) are used in determining admission.
   - Transfer students - Campus admission standards are used for students transferring 54 or fewer semester hours. College of Education, Health, and Human Services admission standards (a minimum cumulative GPA of 2.75/4.0 scale) are used for students transferring 55 or more semester hours.
   - Degreed persons seeking certification only - College of Education, Health, and Human Services admission standards are used for individuals with a bachelor’s degree earned at a regionally accredited institution. The individual must have a cumulative GPA of 2.75 or higher in their major, optional minor, and overall to be admitted to the College of Education, Health, and Human Services and the Teacher Certification Program.

2. A Criminal Background Check Consent form must be submitted online to the CEHHS Office of Student Success within the first semester enrolled.
3. **Proof of valid TB (tuberculosis) clearance** must be submitted online to the CEHHS Office of Student Success within the first semester enrolled.

4. **Evidence of training for Infectious Diseases/Blood-borne Pathogens training** must be completed in the Curriculum Knowledge Center (FCS 267) within the first semester enrolled.

5. **Completion of the Campus Composition Placement Test** within the first semester enrolled (not required for students admitted to the post-degree certification only program).

### Phase Two - Preparation for Admission to the Teacher Certification Program

All requirements listed below must be completed for progression to Phase Three:

1. Successful completion of
   - COMP 105 (Writing & Rhetoric I), transfer credit equivalent, or waiver by Campus Composition Placement Test or university accepted high school Advanced Placement (AP) test score (not required for students admitted to the post-degree certification only program).
   - EDA 205 (Introduction to Education) or transfer credit equivalent.
   - EXPS 298 (Exploring Writing to Communicate, Learn and Teach).
   - COMP 227 (Intermediate Exposition & Argument) if prescribed by the results of the Campus Composition Placement Test (not required for students admitted to the post-degree certification only program).

2. Minimum of 55 earned credit hours, including transfer credit, or previously earned bachelor's degree if applicable, with a minimum cumulative grade point average of 2.75.

3. Submission of completed Application for Admission to Teacher Certification Program (Phase III) form, which includes a moral turpitude statement, to the CEHHS Office of Student Success, 262 FCS.

4. **Phase Three - Admission to Teacher Certification Program**

All requirements listed below must be completed for progression to Phase Four:

1. Successful completion of the appropriate MTTC Certification Tests listed below and official score reporting directly to the University of Michigan-Dearborn (institution code 29):
   - **Elementary** certification students must pass the MTTC Elementary Education Test (#103)
   - **Secondary** certification students must pass the MTTC tests in their major.

2. Completion of at least one full semester (12 credit hours) of study at UM-Dearborn.

3. Completion of Professional Studies sequence of courses.

4. Minimum cumulative GPA of 2.75 on a 4.0 scale as well as a minimum GPA of 2.75 in the major(s) and the Professional Studies sequence.

5. Attendance at a **Student Teaching Application and Placement Meeting** and completion and submission of all forms online to the CEHHS Office of Student Success.

6. Verification with the Office of Student Success that all clearance requirements are valid and up-to-date prior to student teaching.

- TB clearance
- CPR and First Aid Certification (Adult/Infant/Child)
- Evaluation of Oral Expression
- Criminal background checks will be reviewed through ICHAT by the Office of Student Success each semester.

### Phase Four - Teacher Certification Program Completion

All requirements listed below must be completed for recommendation for a degree and/or a State of Michigan Standard Teaching Certificate:

1. For **undergraduate degree seeking students**: Submission of completed Degree/Diploma application to the Enrollment Services Office. This application can be submitted online or printed and submitted in person, and can be found at [https://umdearborn.edu/students/registration-records/graduation-commencement/applying-graduate-0](https://umdearborn.edu/students/registration-records/graduation-commencement/applying-graduate-0/).
   - Elementary certification students apply to graduate as a student in the College of Education, Health, and Human Services.
   - Secondary certification students apply to graduate as a student in the College of Arts, Sciences, and Letters.

2. **Post-degree certification only and undergraduate secondary certification program students** must submit a Program Completor Form online to the CEHHS Office of Student Success.

3. Successful completion of the chosen program, major(s) and professional studies sequence, including student teaching, and supplementary requirements with a minimum cumulative grade point average of 2.75 on a 4.0 scale, as well as minimum grade point average of 2.75 in the major(s) and professional studies sequence.

4. Successful completion of any **additional** MTTC certification tests and official score reporting directly to the University of Michigan-Dearborn (Institution Code 29) for any **additional** endorsements sought. These scores must be reported to the University of Michigan-Dearborn College of Education, Health, and Human Services before recommendations are prepared for the state by the University of Michigan-Dearborn Certification Officer:
   - **Additional** content area major(s) or minor(s), beyond the minimum requirement, for elementary certification students.
   - **Additional** content area major(s) or minor(s), beyond the minimum requirement, for secondary certification students.

Based on this record of achievement, a decision to recommend or not to recommend for certification will be made.

### Elementary Teacher Certification Program

The program as outlined meets the state’s teacher certification requirements at the time of this writing. However, changes by the University or the State may affect some program requirements. Therefore, students are strongly advised to inquire about possible changes by checking with their advisor in the College of Education, Health, and Human Services.

### Academic Program Requirements (Majors and Minors)

Students entering this program are required to complete all core courses pre-professional and all requirements for any selected major. Students are required to select at least 1 of the degree majors listed below. Minor endorsements are optional. Courses in the major and/or minor may not be
elected on a pass/fail basis. Courses that apply to the majors and minors are listed below under “Areas of Study for Majors and Minors.”

**Majors and Minors**

<table>
<thead>
<tr>
<th>Degree Majors</th>
<th>Major Endorsements</th>
<th>Minor Endorsements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Childhood (p. 536)</td>
<td>Early Childhood</td>
<td>English as a Second</td>
</tr>
<tr>
<td></td>
<td>(p. 542)</td>
<td>Language (p. 543)</td>
</tr>
<tr>
<td>Language Arts (p. 567)</td>
<td>Language Arts</td>
<td>Integrated Science</td>
</tr>
<tr>
<td></td>
<td>(p. 545)</td>
<td>(p. 545)</td>
</tr>
<tr>
<td>Mathematics Studies (p. 568)</td>
<td>Mathematics Studies</td>
<td>Language Arts</td>
</tr>
<tr>
<td></td>
<td>(p. 548)</td>
<td>(p. 546)</td>
</tr>
<tr>
<td>Reading (p. 573)</td>
<td>Integrated Science</td>
<td>Mathematics (p. 549)</td>
</tr>
<tr>
<td></td>
<td>(p. 549)</td>
<td>Reading (p. 550)</td>
</tr>
<tr>
<td>Science Studies (p. 574)</td>
<td>Social Studies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(p. 551)</td>
<td></td>
</tr>
<tr>
<td>Social Studies (p. 595)</td>
<td>Special Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(p. 597)</td>
<td></td>
</tr>
</tbody>
</table>

**Professional Requirements**

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
<tr>
<td>EDC 400</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr: Models and Meth</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
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**Methodologies** (See Note #1 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 442</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr: Models and Meth</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
</tr>
</tbody>
</table>

**Professional Semester** (See Notes #3 & #5 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Credit Hours**  42

1 EDD 467 and EDD 471 are to be taken concurrently. Both require EDD 468 as a prerequisite.

**Notes:**

1. **Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.**
2. **Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103).**
3. **Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.**
4. **Minimum number of hours to graduate is 128 semester hours.**

**Minors (Optional)**

- English as a Second Language (p. 543)
- Language Arts (p. 546)
- Reading (p. 550)
- Science (http://catalog.umd.umich.edu/undergraduate/college-education-health-human-services/elementary-school-certification-program/science-studies/#minorertext)

**Elementary Certification Teaching Major - Early Childhood**

The Early Childhood Education Program is designed for those intending to work with children, birth through eight years of age. Within the basic elementary education degree curriculum, it enables students to meet State requirements for a Michigan Elementary Standard Teaching Certificate and the Early Childhood Endorsement (ZS) as well as to gain special competencies in the area of early childhood. It prepares individuals for careers in childcare centers, working with young children and their families, birth through kindergarten, as well as in the elementary grades 1-5. The program includes a concentrated study of the young child in infant/toddler, preschool, and early school contexts with extensive opportunities for field experiences in a variety of settings.

**Major Requirements**

A minimum of 34 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 414</td>
<td>Early Child Ed Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>EDC 439</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>EDC 442</td>
<td>EC: Fam/Sch/Comm Collaboration</td>
<td>3</td>
</tr>
<tr>
<td>EDC 445</td>
<td>Develop Assess of Young Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 406</td>
<td>Teach Strategies Early Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 410</td>
<td>Practicum in Early Child Ed</td>
<td>1</td>
</tr>
<tr>
<td>EDD 411</td>
<td>Directed Tchg: Early Childhood</td>
<td>4</td>
</tr>
<tr>
<td>EDD 412</td>
<td>Seminar in Early Childhood Ed</td>
<td>2</td>
</tr>
<tr>
<td>EDC 431</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 440</td>
<td>The Child: Birth to Three</td>
<td>3</td>
</tr>
<tr>
<td>EDD 446</td>
<td>Intervention Strat EC Spec Ed</td>
<td>3</td>
</tr>
</tbody>
</table>
EDC 466 Cog/Memory Dev in Children 3

Total Credit Hours 34

Major Notes:

1. With the approval of the Early Childhood Program Coordinator, a maximum of six credit hours of freshman and sophomore level transfer courses in early childhood will be considered for general credit toward the early childhood major.

2. An overall GPA of 2.75 or better is required for the major.

3. At least 15 semester hours in UM-Dearborn courses required for a major.

4. A grade of S is required in EDD 411.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.

2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.

3. Minimum GPAs are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.

4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.

5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

6. The minimum number of semester hours required to graduate is 128.

7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

8. Students must meet Dearborn Discovery Core requirements. See umdearborn.edu/696973/ for details.

Professional Requirements

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Foundations</strong></td>
<td></td>
</tr>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Multicultural Education</strong></td>
<td></td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Not Required for Early Childhood Majors</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Psychology</strong></td>
<td></td>
</tr>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Not Required for Early Childhood Majors</td>
<td></td>
</tr>
</tbody>
</table>

### Methodologies (See Note #1 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd 1</td>
<td>3</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct 1</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr: Models and Meth 1</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
</tr>
</tbody>
</table>

### Professional Semester (See Notes #3 & #5 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 42

1. EDD 467 and EDD 471 are to be taken concurrently. Both require EDD 468 as a prerequisite.

Notes:

1. Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.

2. Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103).

3. Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.

4. Minimum number of hours to graduate is 128 semester hours.

### Elementary Certification Teaching Minor - English as a Second Language

This course of study is designed to meet the state of Michigan requirements for teacher certification in English as a Second Language (ESL). To obtain this endorsement, students must pass the certification test in this area, and obtain a Michigan teaching certificate.

### Minor Requirements

Students must demonstrate experience in learning a modern second language or coursework in a modern second language or permission of Program Coordinator or take one semester course in a modern language.

A minimum of 21 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required Courses</strong></td>
<td></td>
</tr>
<tr>
<td>EDD 447</td>
<td>Tchng English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract: Tchng Engl Second Lang</td>
<td>1</td>
</tr>
<tr>
<td>EDC 455</td>
<td>Assmt: Sec Lang Learning K-12</td>
<td>2</td>
</tr>
<tr>
<td>EDC 490</td>
<td>Litrcy Instr &amp; Assess for Els</td>
<td>3</td>
</tr>
<tr>
<td>LING 474</td>
<td>Second Lang Acquisition: Engl</td>
<td>3</td>
</tr>
<tr>
<td>LING 480</td>
<td>Concepts in Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>LING 476</td>
<td>Sociolinguistics</td>
<td>3</td>
</tr>
</tbody>
</table>
A minimum of 36 semester hours from the following:

**Major Requirements**

Elementary Standard Certificate. Bachelor's degree and faculty recommendation for the Michigan Certification. And with successful completion of the program, you'll earn both a bachelor's degree and faculty recommendation for the Michigan Elementary Standard Certificate.

**Program Notes:**

1. A minimum GPA of 2.75 is required for a minor.
2. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.
3. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
4. In order to be recommended for endorsements, students must pass the appropriate MTTC exam in addition to completing the coursework.
5. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

### Required Courses ¹

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPS 220</td>
<td>Science in the Elem School</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 231</td>
<td>Inquiry: Physical Science (see Note #3 below)</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 232</td>
<td>Inquiry: Earth/Planet Science (see Note #3 below)</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 233</td>
<td>Inquiry: Life Science (see Note #3 below)</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 331</td>
<td>Phy. Sci. &amp; Everyday Thinking</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 332</td>
<td>Inquiry: Mich Earth Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 333</td>
<td>Inquiry: PBL in Life Science</td>
<td>3</td>
</tr>
</tbody>
</table>

### Electives

**Physical Science**

- Earth/Planetary Science: 4 credit hours
- Life Science: 4 credit hours

Total Credit Hours: 36

¹ BIOL 240/BIOL 242 and NSCI 120/NSCI 121 cannot be used for science credit.

### Major Notes:

1. 15 semester hours required at UM-Dearborn.
2. 6 semester hours required in courses at the 300 level or above.
3. Transfer students - 2 natural science courses may be transferred to UM-Dearborn:
   a) an introductory physical science will satisfy NSCI 231;
   b) an introductory earth/planetary science will satisfy NSCI 232;
   c) an introductory life science course will satisfy NSCI 233.

### Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. The minimum number of semester hours required to graduate is 128.
7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
8. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details.

---

### Elementary Certification Teaching Major/Minor - Integrated Science

We're helping future generations develop a passion and appreciation for science.

Do you have an innate curiosity about the natural world? Would you like to share that passion with young learners through hands-on experiments? This bachelor's degree program in Integrated Science Studies prepares you for leading diverse classrooms in their study of science's fundamental concepts and disciplines.

Pair your studies with elementary teacher certification and you'll be qualified to teach all subjects in grades K-5; or choose to become certified to teach science in grades 6-8. Either way, you'll be part of a balanced program that combines academic studies, professional training, multiple field experiences in local schools, and thorough training in how to use technology in the 21st-century classroom.

And with successful completion of the program, you'll earn both a bachelor's degree and faculty recommendation for the Michigan Elementary Standard Certificate.

**Major Requirements**

A minimum of 36 semester hours from the following:

Select one of the following: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH/LING 425</td>
<td>Language and Society</td>
</tr>
<tr>
<td>ENGL/LING 461</td>
<td>Modern English Grammar</td>
</tr>
<tr>
<td>ENGL/LING 482</td>
<td>History of the English Lang</td>
</tr>
<tr>
<td>LING 484</td>
<td>World English</td>
</tr>
</tbody>
</table>

Total Credit Hours: 21

**Minor Notes:**

1. LING 480 or LING 280 is a pre-requisite for LING 461/ENGL 461, LING 561/ENGL 561, LING 482/ENGL 482, LING 582/ENGL 582, LING 484/ENGL 484, LING 474/LING 574, and LING 476/LING 576.

---

### Program Notes:

- 1. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
- 2. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
- 3. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
- 4. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

---

### Code Title Credit Hours

#### Required Courses ¹

- EXPS 220: Science in the Elem School: 3 credit hours
- NSCI 231: Inquiry: Physical Science (see Note #3 below): 3 credit hours
- NSCI 232: Inquiry: Earth/Planet Science (see Note #3 below): 3 credit hours
- NSCI 233: Inquiry: Life Science (see Note #3 below): 3 credit hours
- EXPS 420: Science Capstone: 3 credit hours
- NSCI 331: Phy. Sci. & Everyday Thinking: 3 credit hours
- NSCI 332: Inquiry: Mich Earth Science: 3 credit hours
- NSCI 333: Inquiry: PBL in Life Science: 3 credit hours

#### Electives

**Physical Science**

- Earth/Planetary Science: 4 credit hours
- Life Science: 4 credit hours

Total Credit Hours: 36

¹ BIOL 240/BIOL 242 and NSCI 120/NSCI 121 cannot be used for science credit.

---

### Major Notes:

1. 15 semester hours required at UM-Dearborn.
2. 6 semester hours required in courses at the 300 level or above.
3. Transfer students - 2 natural science courses may be transferred to UM-Dearborn:
   a) an introductory physical science will satisfy NSCI 231;
   b) an introductory earth/planetary science will satisfy NSCI 232;
   c) an introductory life science course will satisfy NSCI 233.

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### Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. The minimum number of semester hours required to graduate is 128.
7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
8. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details.
Professional Requirements

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
</tbody>
</table>

Multicultural Education

EXPS 410  Multicult in School and Soc  3

Not Required for Early Childhood Majors

Psychology

EDC 300  Educational Psychology  3
EDC 460  Educating the Exceptional Child  3

Not Required for Early Childhood Majors

Methodologies (See Note #1 below)

EDD 452  Methods of Teaching Math K-8  3
EDD 468  Teach Read/Lang Arts- Elem Grd  3
EDD 467  Practicum in Reading Instruct  1
EDD 471  Reading Instr: Models and Meth  3
EDD 485  Teach Science in the Elem Grd  3
EDD 491  Soc Std Elem Grades Practicum  1
EDD 495  Social Studies in the Elem Grd  3

Professional Semester (See Notes #3 & #5 below)

EDD 435  Dir Teaching: Elementary Sch  12
EDD 437  Sem: Teaching Elementary Grds  1

Total Credit Hours  42

1 EDD 467 and EDD 471 are to be taken concurrently. Both require EDD 468 as a prerequisite.

Program Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. Transfer students - 2 natural science courses may be transferred to UM-Dearborn:
   a) an introductory physical science will satisfy NSCI 231;
   b) an introductory earth/planetary science will satisfy NSCI 232;
   c) an introductory life science course will satisfy NSCI 233.
3. Astronomy satisfies Earth/Planetary Science requirement.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. In order to be recommended for endorsements, students must pass the appropriate MTTC exam in addition to completing the coursework.
7. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

Minor Requirements

A minimum of 24 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>3</td>
</tr>
</tbody>
</table>

NSCI 231  Inquiry: Physical Science (see Note #2 below)  3
NSCI 232  Inquiry:Earth/Planet Science (see Note #2 below)  3
NSCI 233  Inquiry: Life Science (see Note #2 below)  3
EXPS 420  Science Capstone  3
NSCI 331  Phy. Sci. & Everyday Thinking  3
NSCI 332  Inquiry: Mich Earth Science  3
NSCI 333  Inquiry: PBL in Life Science  3

Total Credit Hours  24

1 NSCI 120/NSCI 121 and / cannot be used for science credit.

Notes:

1. Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.
2. Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103).
3. Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.
4. Minimum number of hours to graduate is 128 semester hours.

Elementary Certification Teaching Major/Minor - Language Arts

Few things can empower a person like the ability to read, write and communicate.

Do you dream of helping children learn to read, write, speak and listen? Our bachelor’s degree program in Language Arts thoroughly prepares you for teaching and motivating young readers and writers in diverse classrooms. Pair your studies with elementary teacher certification and you’ll be qualified to teach all subjects in grades K-5; or become certified to teach language arts in grades 6-8 upon meeting the endorsement requirements. Either way, you’ll be part of a well-rounded program that combines academic studies, professional training and multiple field experiences in local schools.

With successful completion of the program, you will earn both a bachelor’s degree and faculty recommendation for the Michigan Elementary Standard Certificate.

Major Requirements

A minimum of 37 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSCI 231</td>
<td>Inquiry: Physical Science (see Note #2 below)</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 232</td>
<td>Inquiry:Earth/Planet Science (see Note #2 below)</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 233</td>
<td>Inquiry: Life Science (see Note #2 below)</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 331</td>
<td>Phy. Sci. &amp; Everyday Thinking</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 332</td>
<td>Inquiry: Mich Earth Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 333</td>
<td>Inquiry: PBL in Life Science</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

1 NSCI 120/NSCI 121 and / cannot be used for science credit.
Follows:
The semester hours are distributed as required prior to student teaching. The semester hours are distributed as the core of your professional preparation. At least two practicums are of 42 semester hours of credit. This concentration of study represents the professional sequence of education courses consists of a minimum of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.

Select two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 447</td>
<td>Tchg English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract: Tchg Engl Secnd Lang (Optional)</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 461</td>
<td>Modern English Grammar</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 475</td>
<td>Issues Lit Child/Yng People</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>LING 280</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>LING 475</td>
<td>Lang Diversity: Arab Amer Comm or LING 477</td>
<td>3</td>
</tr>
</tbody>
</table>

African American English

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 223</td>
<td>Intro to Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 327</td>
<td>Advanced Exposition</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 482</td>
<td>History of the English Lang</td>
<td>3</td>
</tr>
<tr>
<td>LING 475</td>
<td>Lang Diversity: Arab Amer Comm</td>
<td>3</td>
</tr>
<tr>
<td>LING 477</td>
<td>African American English</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 38

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.

2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.

3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.

4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.

5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

6. The minimum number of semester hours required to graduate is 128.

7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

8. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details

Professional Requirements

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 42

1. EDD 467 and EDD 471 are to be taken concurrently. Both require EDD 468 as a prerequisite.

Notes:

1. Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.

2. Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103). The minimum number of hours to graduate is 128 semester hours.

Minor Requirements

A minimum of 24 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDD 447</td>
<td>Tchg English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract: Tchg Engl Secnd Lang</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 461</td>
<td>Modern English Grammar</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 475</td>
<td>Issues Lit Child/Yng People</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
</tbody>
</table>
A minimum of 30 semester hours from the following:

**Elementary Certification Teaching Major - Learning Disabilities**

As a learning disabilities major, you'll train to be an educator who works capably and compassionately with students who have intellectual, social or behavioral challenges. Throughout the program, you'll explore the newest methods for assisting learners with diverse needs, learn to use technology effectively in the 21st-century classroom, and complete multiple field experiences that put you side-by-side with students in local schools.

Plus, this bachelor's degree comes with a faculty recommendation for the Michigan Elementary Standard Certificate with the Learning Disabilities Endorsement.

**Major Requirements**

A minimum of 30 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 401</td>
<td>Introduction to LD</td>
<td>3</td>
</tr>
<tr>
<td>EDN 403</td>
<td>Assessment of the Learner</td>
<td>3</td>
</tr>
<tr>
<td>EDN 404</td>
<td>Assessment Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDN 401</td>
<td>Strategies for LD</td>
<td>3</td>
</tr>
<tr>
<td>EDN 402</td>
<td>Socio-vocational Transitions</td>
<td>3</td>
</tr>
<tr>
<td>PDED 405</td>
<td>Sp Ed Legisln &amp; Litigation</td>
<td>3</td>
</tr>
<tr>
<td>EDC 417</td>
<td>Mgmt of Classroom Behavior</td>
<td>3</td>
</tr>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDT 430</td>
<td>Assistive Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDD 413</td>
<td>LD Elem Directed Teaching</td>
<td>2</td>
</tr>
<tr>
<td>EDD 420</td>
<td>LD Sec Directed Teaching</td>
<td>2</td>
</tr>
<tr>
<td>EDN 408</td>
<td>LD Directed Teaching Seminar</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credit Hours 31

1. Core courses included in minor semester hours.
2. Practicum is optional in the minor.

Program Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.
3. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
4. In order to be recommended for endorsements, students must pass the appropriate MTTC exam in addition to completing the coursework.
5. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

**Professional Requirements**

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Multicultural Education**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
</tbody>
</table>

Not Required for Early Childhood Majors

**Psychology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
</tr>
</tbody>
</table>

Not Required for Early Childhood Majors

**Methodologies** (See Note #1 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr. Models and Meth</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Not Required for Early Childhood Majors

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**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. For admission to Phase III of the teacher certification program, passing scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score of 480) and in Mathematics (passing score 530) are required. The SAT must have been passed on or after March 5, 2016.
5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
6. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
7. The minimum number of semester hours required to graduate is 128.
8. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
A minimum of 30 semester hours from the following:

**Major Requirements**
Elementary Standard Certificate.

With successful completion of the program, you will earn both a bachelor's degree and faculty recommendation for the Michigan Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.

Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103).

Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.

Minimum number of hours to graduate is 128 semester hours.

### Major Requirements

A minimum of 30 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
<td></td>
</tr>
<tr>
<td>MATH 113</td>
<td>Calc I for Biology &amp; Life Sci</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 115</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 442</td>
<td>Geometry for Teachers</td>
<td>3</td>
</tr>
<tr>
<td>MATH 443</td>
<td>Algebra for Teachers</td>
<td>3</td>
</tr>
</tbody>
</table>

### Professional Requirements

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
</tbody>
</table>
### Not Required for Early Childhood Majors

- **Psychology**
  - EDC 300  Educational Psychology  3
  - EDC 460  Educating the Exceptional Child  3

### Methodologies (See Note #1 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr: Models and Meth</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
</tr>
</tbody>
</table>

### Professional Semester (See Notes #3 & #5 below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours: 42

1. EDD 467 and EDD 471 are to be taken concurrently. Both require EDD 468 as a prerequisite.

### Notes:

1. Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.
2. Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103).
3. Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.
4. Minimum number of hours to graduate is 128 semester hours.

### Minor Requirements

A minimum of 20 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 442</td>
<td>Geometry for Teachers</td>
<td>3</td>
</tr>
<tr>
<td>MATH 443</td>
<td>Algebra for Teachers</td>
<td>3</td>
</tr>
<tr>
<td>MATH 131</td>
<td>Conceptual Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 300</td>
<td>Math Lang Proof &amp; Struct</td>
<td></td>
</tr>
<tr>
<td>MATH 297</td>
<td>The Nature of Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 391</td>
<td>Topics in Mathematics Edu</td>
<td></td>
</tr>
</tbody>
</table>

### Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 444</td>
<td>Data Anlys,Prob&amp;Stat forTchrs</td>
<td></td>
</tr>
<tr>
<td>MATH 445</td>
<td>Number &amp; Prop1 Rsng for Tchrs</td>
<td></td>
</tr>
<tr>
<td>MATH 446</td>
<td>Discrete Math/Modeling for Tch</td>
<td></td>
</tr>
<tr>
<td>MATH 447</td>
<td>Micro in Math for Teachers</td>
<td></td>
</tr>
<tr>
<td>STAT 263</td>
<td>Introduction to Statistics</td>
<td></td>
</tr>
</tbody>
</table>

### Program Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. .5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
3. In order to be recommended for endorsements, students must pass the appropriate MTTC exam in addition to completing the coursework.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.
5. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

### Elementary Certification Teaching Major/Minor - Reading

Empower students with the skills that will support them in all of their future educational opportunities.

A bachelor’s degree in Reading with elementary teacher certification will prepare you to become a classroom teacher for all subjects in grades K-5; or, become certified to teach developmental/remedial reading classes upon meeting the endorsement requirements. Either way, you’ll be ready to work with diverse learners with a program that combines academic studies, professional training and multiple field experiences in local schools.

With successful completion of the program, you will earn both a bachelor’s degree and faculty recommendation for the Michigan Elementary Standard Certificate.

### Major Requirements

A minimum of 32 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDC 431</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>or EDC 442</td>
<td>EC: Fam/Sch/Comm Collaboration</td>
<td></td>
</tr>
</tbody>
</table>

or course approved by a Reading advisor
EDC 476  Literacy Assessmnt for Instr 4
EDD 447  Tchng English as Second Lang 3
EDD 448  Pract: Tchng Engl Second Lang 1
EDD 469  Reading in the Content Areas 3
EXPS 298  Exp Writing-Comm Learn&Tch 3
EXPS 460  Capstone: Trnds & Iss Literacy 3
LIBR 465  Literature for Children 3
LIBR 470  Literature for Young People 3
LIBR 475  Issues Lit Child/Yng People 3

Total Credit Hours 32

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. The minimum number of semester hours required to graduate is 128.
7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
8. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details

Professional Requirements
The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Chld</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 475</td>
<td>Issues Lit Child/Yng People</td>
<td>3</td>
</tr>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>1</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
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</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr: Models and Meth</td>
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<tr>
<td>EDD 485</td>
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<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
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<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 42

Notes:

1. Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.
2. Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area test: Elementary Education (#103).
3. Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.
4. Minimum number of hours to graduate is 128 semester hours.

Minor Requirements
A minimum of 20 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDC 476</td>
<td>Literacy Assessmnt for Instr</td>
<td>4</td>
</tr>
<tr>
<td>EDD 447</td>
<td>Tchng English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract: Tchng Engl Second Lang</td>
<td>1</td>
</tr>
<tr>
<td>EDD 469</td>
<td>Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 475</td>
<td>Issues Lit Child/Yng People</td>
<td>3</td>
</tr>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>1</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr: Models and Meth</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
<tr>
<td>EDD 437</td>
<td>Sem: Teaching Elementary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 20

Program Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.
3. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
4. In order to be recommended for endorsements, students must pass the appropriate MTTC exam in addition to completing the coursework.
5. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

### Elementary Certification Teaching Major - Social Studies

Help young learners understand the social forces that shape our society. From the study of history to understanding how our government works, social studies curriculum is essential for young citizens.

This program will train you in the latest strategies for teaching students about the important cultural, economic, geographic, political and social dimensions of human society, with an emphasis on evidence-based lessons and creative projects that enhance learning.

A bachelor’s degree in social studies with elementary teacher certification will prepare you to teach all subjects in grades K-5; or with the social studies major, you can become certified to teach social studies subjects in grades 6-8. Plus, with successful completion of the program, you'll earn both a bachelor’s degree and faculty recommendation for the Michigan Elementary Standard Certificate.

**Major Requirements**

A minimum of 36 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPS 282</td>
<td>History &amp; Civics Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 283</td>
<td>Geography &amp; Econ Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>HIST 112</td>
<td>The American Past II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3601</td>
<td>Michigan History</td>
<td>3</td>
</tr>
<tr>
<td>POL 101</td>
<td>American Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 371</td>
<td>Problems in Intl Politics</td>
<td>3</td>
</tr>
<tr>
<td>or POL 471</td>
<td>American Foreign Policy I</td>
<td>3</td>
</tr>
<tr>
<td>or POL 472</td>
<td>American Foreign Policy II</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 206</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>300 Level GEOG Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 2001</td>
<td>Introductory Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

**Major Notes:**

1. 12 semester hours required at UM-Dearborn.
2. 9 semester hours at 300 level or above required.

**Program Notes:**

1. *All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.*

2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. For admission to Phase III of the teacher certification program, passing scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score of 480) and in Mathematics (passing score 530) are required. The SAT must have been passed on or after March 5, 2016.
5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
6. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
7. The minimum number of semester hours required to graduate is 128.
8. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

### Professional Requirements

The professional sequence of education courses consists of a minimum of 42 semester hours of credit. This concentration of study represents the core of your professional preparation. At least two practicums are required prior to student teaching. The semester hours are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed (Multicultural Education)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Multicultural Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
<tr>
<td>Not Required for Early Childhood Majors</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Psychology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>Not Required for Early Childhood Majors</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Methodologies (See Note #1 below)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDD 452</td>
<td>Methods of Teaching Math K-8</td>
<td>3</td>
</tr>
<tr>
<td>EDD 468</td>
<td>Teach Read/Lang Arts- Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 467</td>
<td>Practicum in Reading Instruct</td>
<td>1</td>
</tr>
<tr>
<td>EDD 471</td>
<td>Reading Instr. Models and Meth</td>
<td>3</td>
</tr>
<tr>
<td>EDD 485</td>
<td>Teach Science in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 491</td>
<td>Soc Std Elem Grades Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDD 495</td>
<td>Social Studies in the Elem Grd</td>
<td>3</td>
</tr>
<tr>
<td><strong>Professional Semester (See Notes #3 &amp; #5 below)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDD 435</td>
<td>Dir Teaching: Elementary Sch</td>
<td>12</td>
</tr>
</tbody>
</table>
General Studies

The College of Education, Health, and Human Services awards the Bachelor of General Studies degree (BGS) in the following program.

Children and Families BGS

The Children and Families Program is a Bachelor of General Studies degree. This program is a four-year degree program without elementary teaching certification, designed for students who wish to pursue careers in child care centers, teaching and administration, social service agencies or in other work with children and families. The 2+2 Children and Families BGS Program is designed to combine selected two-year community college associate degree programs with two years of coursework at the UM-Dearborn. The associate degrees eligible for this program must be covered by articulation agreements between the community college and the UM-Dearborn, College of Education, Health, and Human Services, or are accepted with permission of the Children and Families academic advisor.

UM-Dearborn students may be admitted to the Children and Families Program with a minimum grade point average of 2.5.

Coursework at Community College

Credits earned to complete designated community college associate degrees will be accepted for the UM-Dearborn BGS degree as lower-division credit (up to a maximum of 62 hours). Courses not applied toward meeting BGS distribution requirements or program prerequisites will be utilized as elective courses or general credit toward the Children and Families BGS degree. (Examples of the variety of community college associate degrees that could be appropriate for this 2+2 program are: Early Childhood Education and Care, and Family Support Services.)

Courses to be taken at UM-Dearborn

Students must complete Composition 227 (at UM-Dearborn). Students must complete at least 48 hours in courses numbered 300 or above, of which at least 21 hours must be in the College of Education, Health, and Human Services. Courses must be distributed such that three areas of focus are developed, including: 1) Child Studies (Area I); 2) Behavioral Studies (Area II); and 3) an Elective area (Area III) to be chosen by the student with advisor approval. A minimum of 27 upper-level hours must be in Child Studies (Area I) and 9 upper-level hours in Behavioral Studies (Area II) must be earned at UM-Dearborn.

The remaining coursework at UM-Dearborn (to total the required 58-60) will be elected from either lower- or upper-division courses. These can be used to complete core requirements, to meet specific prerequisites, or to meet requirements and strengthen background in the Child Studies area.

To complete the program, students must have a 2.5 grade point average overall, 2.5 in Child Studies (Area I) and 2.5 in Behavioral Studies (Area II), and at least a 2.5 in the Elective area (Area III). A total of 120 credit hours is necessary to graduate.

Areas of Study

The student will elect courses in three areas of study, as follows:

<table>
<thead>
<tr>
<th>Area I</th>
<th>Area II</th>
<th>Area III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Studies</td>
<td>Behavioral Science</td>
<td>Elective Area</td>
</tr>
<tr>
<td>31-40 hrs</td>
<td>18 hrs</td>
<td>12+ hrs</td>
</tr>
</tbody>
</table>

Elective Area selected with advisor approval from:

- Anthropology
- Business
- Communication
- Comp. Info. Science
- Education (highly recommended)
- English
- French
- German
- Health Policy Studies
- Mathematics
- Natural Science
- Political Science
- Psychology
- Social Studies
- Sociology
- Spanish
- Women's Studies

Notes:

1. The student may select an alternative third area of study (i.e., one which is not listed above) if approved by an academic advisor.
2. If Education is selected as the Elective Area, the following courses may not be elected: EDD 452, EDD 467, EDD 468, EDD 471, EDD 485 and EDD 495.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)
Upper Level Writing Intensive (GEWI) – 3 Credits [link]

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits [link]

Critical and Creative Thinking (GECC) – 3 Credits [link]

**Areas of Inquiry**

**Natural Science (GENS)** – 7 Credits [link]
- Lecture/Lab Science Course
- Additional Science Course

**Social and Behavioral Analysis (GESB)** – 9 Credits [link]

**Humanities and the Arts (GEHA)** – 6 Credits [link]

**Intersections (GEIN)** – 6 Credits [link]

**Capstone**

Capstone (GECE) – 3 Credits [link]

**Core Course Requirements for Children and Families BGS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>COMP 106</td>
<td>Writing &amp; Rhetoric II</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 250</td>
<td>Elem Ed Via &amp; Perf Arts</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 200</td>
<td>Understanding Society</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 120</td>
<td>Matter, Energy, and Life I</td>
<td>4</td>
</tr>
<tr>
<td>NSCI 121</td>
<td>Matter, Energy, and Life II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 32

**Child Studies (Area I)**

2.5 GPA required, 27 hours at 300+ at UM-Dearborn required.

**Capstone (GECE)** – 3 Credits [link]

**Behavioral Studies (Area II)**

2.5 GPA required, 9 hours 300+ at UM-Dearborn required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>2</td>
</tr>
<tr>
<td>EDC 414</td>
<td>Early Child Ed Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>EDD 406</td>
<td>Teach Strategies Early Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 410</td>
<td>Practicum in Early Child Ed</td>
<td>1</td>
</tr>
<tr>
<td>EDD 412</td>
<td>Seminar in Early Childhood Ed</td>
<td>2</td>
</tr>
<tr>
<td>EDD 411 or EDD 418</td>
<td>Directed Tchg: Early Childhood</td>
<td>4</td>
</tr>
</tbody>
</table>

3 Students who transfer in Child Development Practicum will receive elective credit. EDC 241 practicum placement as advised.

4 This course requires a satisfactory grade.

5 Other College of Education, Health, and Human Services courses may be substituted with written permission of an advisor.

**Electives**

Select courses from the following: [link]

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 412</td>
<td>Social Devl/Pos Guidnce Techn</td>
<td>3</td>
</tr>
<tr>
<td>EDC 431</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 446</td>
<td>Cog/Memory Dev in Children</td>
<td>3</td>
</tr>
<tr>
<td>EDD 446</td>
<td>Intervention Strat EC Spec Ed</td>
<td>2</td>
</tr>
<tr>
<td>EXPS 407</td>
<td>Inquiry-based Math and Science</td>
<td>2</td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credit Hours 35-42

1 Waived if transfer credit is granted, if waived, EDC 440 must be elected in area II.

2 Students who transfer in Child Development Practicum will receive elective credit. EDC 241 practicum placement as advised.

3 Students interested in teaching in preschools, Head Start or child care programs must elect EDD 411. Transcripts will read Children and Families: Early Childhood. Students interested in working with children and families in agencies must elect EDD 411. Transcripts will read Children and Families: Family Support.

4 This course requires a satisfactory grade.

5 Other College of Education, Health, and Human Services courses may be substituted with written permission of an advisor.

**School of Education**

**Facilities**

- One of the following is required unless a lower-division transfer course is approved by an academic advisor:
  - SOC 445 The Family
  - or SOC 446 Marriage and Family Problems

**Electives**

At least one course from each of the following three disciplines is required:

1 Transcripts will read Children and Families: Early Childhood. Students interested in working with children and families in agencies must elect EDD 411. Transcripts will read Children and Families: Family Support.

2 This course requires a satisfactory grade.

3 Other College of Education, Health, and Human Services courses may be substituted with written permission of an advisor.
Anthropology:

ANTH 101  Introduction to Anthropology
ANTH 202  World Cultures
ANTH 315  Body Image and Culture
ANTH 325  Anth of Health and Environment
ANTH 331  Human Evolution
ANTH 421  Education and Culture

Psychology:

PSYC 300  Life-Span Developmental Psych
PSYC 315  Personality Development
PSYC 320  Social Psychology
PSYC 322  Psychology of Prejudice
PSYC 325  Psych of Interpersonal Relation
PSYC 375  Psychology of Language
PSYC 404  Parent-Child Relations
PSYC 405  Gender Roles
PSYC 418  Cognitive Development
PSYC 442  Child Psychopathology
PSYC 450  Personality Theory
PSYC 461  Learning and Memory

Sociology:

SOC 201  Contemporary Social Problems
SOC 350  Poverty and Inequality
SOC 382  Social Psychology
SOC 403  Minority Groups
SOC 423  American Social Classes
SOC 435  Urban Sociology
SOC 443  Gender Roles
SOC 445  The Family
SOC 446  Marriage and Family Problems
SOC 447  Family Violence
SOC 454  Mental Health and the Law
SOC 456  Health Care and the Law
SOC 457  Family, Aging and the Law
SOC 458  Sociology of Education
SOC 478  Social Work Internship

Electives (Area III)

Select from the following list with approval of advisor. Community College Childcare courses transfer here.

Anthropology
Business
Communication
Education (highly recommended)
English
French
German
Health Policy Studies
Mathematics
Natural Science
Political Science

Psychology
Social Studies
Sociology
Spanish
Women's Studies

Note: Course numbers and offerings may have changed; please consult your faculty advisor regarding updated course numbers.

Health and Human Services

The Bachelor's Degree in Health and Human Services (HHS) focuses on preparing students to identify and meet the needs of vulnerable individuals, families and communities. Using evidence-based best practices, graduates will be able to develop, offer, and evaluate programs that help people and groups function more effectively and overcome considerable individual and social challenges. The bachelor's degree in Health and Human Services has three rigorous and complementary concentrations: (1) Public Health; (2) Human Services; and (3) Pre-Health Professions.

Students in all three concentrations will be grounded in multidisciplinary, ethical, and state-of-the-art approaches to the delivery of public health interventions, human services, and medical care. This program is rooted in strong academics, innovative research, and active learning. The Health and Human Services major emphasizes community engagement and academic service learning. Students are encouraged to connect their classroom lessons to professional activities through mentored internships with non-profit organizations, community and social service agencies, governmental departments, hospitals and health care organizations across our region and beyond.

This program is intended for students interested in careers and additional graduate degree training in public health, social work, child life, health policy and administration, child and family services, addiction and recovery services, as well as specialized health care professions including medicine, physician assistant studies, pharmacy, physical therapy, occupational therapy, dentistry, optometry, and nursing.

Program Goals

The overall goals of the Health and Human Services program are to prepare students to:

1. Promote health, wellness, and effective functioning in individual, family, group, community, and organizational settings;
2. Demonstrate knowledge of the many determinants of individual and population health including specific risk factors for physical and mental illness, substance use and addiction, poverty and income inequality, attitudes and behaviors, and their impacts on the health and human services delivery system; and
3. Employ appropriate research methods, data analytic techniques, and human subjects protections to enhance our understanding and delivery of effective public health programs and human services.

Learning Outcomes

The Health and Human Services program provides future professionals with strong a behavioral and social science orientation that also draws on considerable expertise in the natural sciences, humanities, education, and statistics. Students study important perspectives that broaden and deepen their understanding of health, human service systems, and the delivery of health care. The goal is to provide students with analytic frames of reference, as well as research and evaluation approaches
that illuminate issues and provide a sound basis for approaching contemporary social and medical problems. Students participate in undergraduate coursework that prepares them for professional work, strengthens their position for admission to graduate programs, and enhances their cultural competencies. HHS students achieve specific professional skills in:

- Problem solving: Identify and respond quickly to health and human services challenges.
- Components of the health and human services system: Understand how policy, behavior, race, place, income, the environment, and other influences converge to affect individuals, families, and communities.
- Leadership: Learn community outreach, public policy, and advocacy skills.
- Management and teamwork: Gain organizational and team-building skills that facilitate cross-sector collaboration, effective interprofessional activities, and change management.
- Global approach: Become aware of cultural and geopolitical factors that shape human and institutional behavior and that have consequences for vulnerable populations.
- Policy: Understand the policy process so that professionals can advocate for meaningful institutional and social change.
- Analytic methods: Know scientific method and appropriate analytic approaches so that students can solve problems using qualitative and quantitative data.
- Technology and information: Use information technology effectively.
- Budgeting and finance: Learn basic skills for making decisions that involve budgetary and financial concerns.
- Communications – Write and speak effectively to reach multiple audiences.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course


Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Major**

The Health and Human Services major includes 50 credit hours of core courses, 30-31 credit hours in concentration-specific required courses, plus 39-40 credit hours in tailored elective courses selected to meet professional goals and any graduation admissions requirements as desired. Students should also refer to the Dearborn Discovery Core requirements to ensure that those are met.

**Health and Human Services Core Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>COMP 106</td>
<td>Writing &amp; Rhetoric II</td>
<td>3</td>
</tr>
<tr>
<td>HHS 100</td>
<td>Personal Health and Wellness</td>
<td>4</td>
</tr>
<tr>
<td>HHS 200</td>
<td>Introduction to Public Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 201</td>
<td>Medical Terminology</td>
<td>3</td>
</tr>
<tr>
<td>HHS 210</td>
<td>Intro to Social Work</td>
<td>3</td>
</tr>
<tr>
<td>HHS 230</td>
<td>Research Methods in Human Srvc</td>
<td>3</td>
</tr>
<tr>
<td>HHS 250</td>
<td>Intro to Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 300</td>
<td>Intro to Health Policy</td>
<td>3</td>
</tr>
<tr>
<td>HHS 310</td>
<td>System of Care</td>
<td>3</td>
</tr>
<tr>
<td>HHS 406</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>HHS 410</td>
<td>Quantitative Research</td>
<td>4</td>
</tr>
<tr>
<td>HHS 442</td>
<td>Medical Ethics</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 233</td>
<td>Critical Thinking</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 200</td>
<td>Understanding Society</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 50

**Tailored Elective Courses**

Student should choose from a tailored list of electives to complete their upper level credit and minimum degree requirements. Students are encouraged to choose elective courses to meet their personal and
professional goals, prepare for graduate entrance exams, and complete any prerequisite courses required of graduate programs and medical schools. Courses outside of the recommended list are subject to approval by the Department Chair and/or Academic Advisor. Please note some elective classes may require additional pre-requisite courses. Course elections must be different from concentration requirements.

## Concentrations

### Human Services Concentration Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHS 305</td>
<td>Introduction to Play</td>
<td>3</td>
</tr>
<tr>
<td>HHS 306</td>
<td>Program Plan Implementation</td>
<td>3</td>
</tr>
<tr>
<td>HHS 308</td>
<td>Intro to Macro Social Work</td>
<td>3</td>
</tr>
<tr>
<td>HHS 309</td>
<td>Theories &amp; Pract. Social Wk.</td>
<td>3</td>
</tr>
<tr>
<td>HHS 311</td>
<td>Work w/Vulnerable Populations</td>
<td>3</td>
</tr>
<tr>
<td>HHS 312</td>
<td>Family Preservation &amp; Recovery</td>
<td>3</td>
</tr>
<tr>
<td>HHS 313</td>
<td>Metro Impact of HHS</td>
<td>3</td>
</tr>
<tr>
<td>HHS 400</td>
<td>Health Policy and Politics</td>
<td>3</td>
</tr>
<tr>
<td>HHS 407</td>
<td>Fundraising &amp; Grantwriting</td>
<td>3</td>
</tr>
<tr>
<td>HHS 425</td>
<td>Work w/Child in Health Setting</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 30

### Pre-Health Professions Concentration Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 136</td>
<td>General Chemistry IIA</td>
<td>4</td>
</tr>
<tr>
<td>COMM 365</td>
<td>Health Communication</td>
<td>3</td>
</tr>
<tr>
<td>HHS 311</td>
<td>Work w/Vulnerable Populations</td>
<td>3</td>
</tr>
<tr>
<td>HHS 360</td>
<td>Responsible Drug Policy</td>
<td>3</td>
</tr>
<tr>
<td>HHS 412</td>
<td>Principles of Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>HHS 456</td>
<td>Health Care and the Law</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 31

### Public Health Concentration Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 365</td>
<td>Health Communication</td>
<td>3</td>
</tr>
<tr>
<td>HHS 260</td>
<td>Global Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 306</td>
<td>Program Plan Implementation</td>
<td>3</td>
</tr>
<tr>
<td>HHS 350</td>
<td>Comm Organizing for Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 400</td>
<td>Health Policy and Politics</td>
<td>3</td>
</tr>
<tr>
<td>HHS 401</td>
<td>Methods of Health Promotion</td>
<td>3</td>
</tr>
<tr>
<td>HHS 405</td>
<td>Population Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 407</td>
<td>Fundraising &amp; Grantwriting</td>
<td>3</td>
</tr>
<tr>
<td>HHS 412</td>
<td>Principles of Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>HHS 430</td>
<td>Hlth Behavior &amp; Hlth Education</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 30

## Courses

### HHS 100 Personal Health and Wellness 4 Credit Hours

In this course, students will examine the core concepts, conceptual frameworks, and epidemiological data related to personal health and wellness. Students will learn to apply the scientific method to the systematic study of common health problems. Students will gain a better understanding of their own health-related attitudes, beliefs, and behaviors and learn strategies to manage their stress and improve their health and wellness. (FS,W)

### HHS 101 Intro to Health Education 3 Credit Hours

This course is designed to introduce students to the principles and practices of health education. Students will explore the theoretical and practical issues of health education and will identify and apply health education principles to health challenges facing individuals, groups and communities. (F,W,S)

### HHS 200 Introduction to Public Health 3 Credit Hours

Introduction to Public Health (HHS 200) is the introductory professional course in the Public Health undergraduate program. This course identifies and explores the theoretical and practical issues in public health. Students successfully completing the course will have an understanding of the goals of public health. Students will receive a fundamental understanding of epidemiological study design and the role of data for public health research. They will also understand the impact of individual behaviors and the environment on health. Lastly, students will receive an introduction of the role of governmental agencies and policy on public health practice.

### HHS 201 Medical Terminology 3 Credit Hours

This course will focus on an in-depth presentation of medical language to serve as a solid foundation for students interested in health care, medicine, nursing, pharmacy, physical therapy, or related careers. Medical terminology for both health and disease is presented in relation to human structure and function. Understanding of the course content builds a framework by introducing the key terms as they are applied to specific body systems. (F,W,S)

### HHS 202 Mental Health Terminology 3 Credit Hours

Mental Health Medical Terminology orient students to mental health disorders. A brief clinical overview from a lay perspective orient students to the various mental disorders including mental retardation and learning disorders, behavioral disorders, anxiety disorders, substance abuse disorders, impulse control disorders and sleep disorders. A special emphasis will be made on the relationship between substance abuse problems and mental illness, as well as the physical aspects of drug use. Students learn the specific criteria for mental illness classification through use of The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM 5). (OC)

### HHS 210 Intro to Social Work 3 Credit Hours

Introduction to Social Work is intended to provide a basic introductory course to assist professionals in related and relevant fields in the theories, approaches, and practices of social work. Students will be exposed to the art and science of the social work discipline through academic research and case studies, experiential learning, group discussion, and supporting activities. (F,W,S)
HHS 225 Stress Management 3 Credit Hours
This course is a systematic examination of the stress process and its management. We will explore what stress is, its major components and psychophysiological processes, as well as the connection between stress and health outcomes. Students will employ self-reflective and active learning techniques to examine in detail the range of options that may be employed to minimize the impact of stressors and their health consequences. These options include perception interventions and spirituality, multiple relaxation techniques, and physiological interventions such as exercise. (F,W,S)

HHS 230 Research Methods in Human Srvcs 3 Credit Hours
This course focuses on developing students' ability to understand and influence scientific inquiry in health and human services. Students will learn how research methodology frames inquiry and, subsequently, how knowledge is built and used to make evidence-based decisions in practice.

HHS 250 Intro to Environmental Health 3 Credit Hours
This course introduces students to environmental health as a core discipline within the field of public health. It is for any student interested in how the environments where we live, work, and play may affect our health, and it is particularly applicable for those pursuing careers in public health, clinical health, or allied fields. Specifically, the course provides students with an introduction to environmental health science, communication, and policy. Students will examine many case studies to understand the patterning and implications of environmental risks and protective factors in communities through Metro Detroit and the U.S. related to several key pathways (e.g., air, water, climate, built environment). Throughout the semester, considerable attention will be given to causes and consequences of local and national environmental justice issues. Students will gain exposure to methods and resources they may use to assess and address environmental health concerns as scholars, activists, or practitioners. (W)

HHS 260 Global Health 3 Credit Hours
In this course, students will examine the core concepts, major actors and organizations, and functions of public health on a global scale. Students will gain knowledge of comparative health care systems, as well as global challenges, such as climate change, nutrition, and maternal and child health. We will analyze historic and contemporary case studies to better understand current disease burden and health inequities, ethical considerations, and potential policy or programmatic solutions to global health issues. (YR)

HHS 305 Introduction to Play 3 Credit Hours
This course introduces the concept, theory, and experience of play, including methodological approaches to the research and study of play in therapeutic, clinical, medical, and educational environments. Students will develop strategies for observing, engaging, and supporting play in variety of settings, and will gain an understanding of the principles, applications, and limitations of play therapy and the role of play in the practice of professionals in human services and education. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman

HHS 306 Program Plan Implementation 3 Credit Hours
Full Course Title: Program Planning and Implementation This course introduces students to program planning in health and human service settings. In these settings, leaders must be able to develop, implement, and monitor programs that are informed by theory and evidence. Such plans equip organizations to improve individual, family and community well-being through programmatic interventions, as well as to advocate for local or national policy changes. Students will examine existing programs designed to promote health and well-being in diverse settings locally and nationally. They will learn components of effective program plans and work through a stepwise process to build their own plan for a real or imagined intervention. Prior or concurrent coursework in theory of health behavior or social work and research methods is highly recommended.
Prerequisite(s): COMP 106
Restriction(s):
Can enroll if Class is Junior or Senior

HHS 308 Intro to Macro Social Work 3 Credit Hours
This course provides a foundation for working with groups, communities, and social systems. We will examine macro-level interventions to address planned change in diverse settings. A culturally-sensitive, person-centered approach as well as the NASW Code of Ethics will be integral to the techniques and practices employed in this course. We will utilize a social justice framework throughout the course for exploring issues of inequality, oppression, and equity-focused social change. (F, S, W)
Prerequisite(s): SWK 200 or HHS 210

HHS 309 Theories & Pract. Social Wk. 3 Credit Hours
Full Course Title: Theories & Pract. Social Wk. This course is designed to develop the knowledge and skills necessary for students to begin understanding of the practice of social work. The course provides an overview of general practice and theory. Students are introduced to the value, philosophy and knowledge base considerations of social work practice. Generalist social work practice is presented as a process of planned change with various clients and systems as well as the application of ethical and technical principles of practice. Specific emphasis will be given in this course to the integration of material from the student's knowledge of human behavior, social policy, research, life experience, and professional skills. Lessons and exercises are offered to emphasize understanding and relating to persons of diverse backgrounds including oppressed groups, populations-at risk and racial or ethnic minorities. (F,W,S)
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is Freshman
HHS 310 System of Care  3 Credit Hours
This course introduces students to the ways that health and human service organizations work individually and collectively to improve the lives of individuals, families, groups, and communities. Health and human services professionals work collaboratively to help persons with a variety of physical, mental, social, emotional, educational, and developmental needs. Systems of care is a service delivery approach that builds partnerships to create a broad, integrated process for meeting clients’ and target populations’ multiple needs. (YR)

HHS 311 Work w/Vulnerable Populations  3 Credit Hours
Full Course Title: Working with Vulnerable and Hard-to-reach-Populations Successful community-based engagement, outreach activities, and intervention research often involves working with vulnerable and hard-to-reach populations. This course examines some of the personal, social, institutional, legal and environmental factors that create disparities and vulnerabilities in certain individuals and groups. Underlying theories, effective strategies, and best strategies for working with persons in great need for improved health and the provision of appropriate human services are also presented. (F,W,S)
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is Freshman

HHS 312 Family Preservation & Recovery  3 Credit Hours
Current methods for family preservation and helping families cope with family problems are the focus of this seminar style course. Through lectures, written assignments and classroom activities, students learn and practice family intervention technique. Emphasis on families with diverse structures is undertaken and diverse practice settings including home, school, child welfare, mental health, family court, corrections and other community environments are explored in detail. Students are instructed in the special issues in work w/families, e.g. minority status, gender and sexual orientation, disabilities, family violence, trauma and addiction. (F,W,S)
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is Freshman

HHS 313 Metro Impact of HHS  3 Credit Hours
Full Course Title: Metropolitan Impact of Health and Human Services This course focuses on health and human service provision and the impacts of these professions within the metropolitan Detroit area. The course addresses working with multiple populations and multiple service providers. A significant component of the course consists of significant guests speakers who have experience working in this area. The class will often meet off-campus at various social service agencies; students will be responsible for their own transportation.
Prerequisite(s): SWK 200 or HHS 210
Restriction(s):
Cannot enroll if Class is Freshman

HHS 315 Case Management for Change  3 Credit Hours
Students learn step-by-step processes of case management from intake and initial referral for services, determination of eligibility for services, writing a formal plan for services, case documentation techniques, and techniques for monitoring a client’s progress through the service delivery system, to case closure/follow-up activities. The course instructs on access to community resources, interpreting and utilizing information from other professionals, and development of interviewing, intervention, case recording, and caseload management skills. Legal and ethical issues in service delivery are integrated throughout the course. (F,W,S)

HHS 325 Death, Dying, and Bereavement  3 Credit Hours
This course focuses on working with children, adolescents, and families experiencing dying, death, and grief. The course emphasizes the role of families, culture, and healthcare settings, as well as the social meanings of dying and death, developmental perceptions, and the impact of culture, religion, and ethnicity. Specific attention is given to grief reactions in children, the application of developmental level in response to loss, role of human services professionals in clinical and non-clinical settings, as well as the tasks of grief. Strategies and tools relating to communicating with bereaved children, as well as the potential impact on academic, behavioral, and emotional development are addressed. Students will explore and develop familiarity with strategies and tools such as legacy building, memento creation, and the identification and utilization of resources that promote coping skills in relation to death or impending death. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 336 Perspectives in Women's Health  3 Credit Hours
This course examines women's health issues across the human lifespan, using feminist and sociocultural perspectives. Topics to be explored include the social construction of women's sexuality, reproductive options, health care alternatives and risk for physical and mental illness. Attention to the historical, economic, and cultural factors that influence the physical and psychological well-being of women is an underlying theme. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman

HHS 350 Comm Organizing for Health  3 Credit Hours
Community organizing is a process by which communities and organizations work together to identify common problems and objectives, acquire and mobilize resources, and create and implement actions to achieve their goals. Community organizing is of interest to sociologists, organization theorists, political scientists, health educators, and social psychologists, among others, as scholars who contribute to our knowledge of working in and with communities. Drawing on these various disciplines and real world case studies, this course examines community organizing theories, models, and principles and how they are used to improve community health and address health inequities. Several practical tools, strategies, and skills are also introduced, including: community assessment, coalition-building, participatory research and evaluation, media advocacy, and policy advocacy. A primary component of this course is the field experience, in which students are partnered with community-based organizations to identify, apply, and reflect on course concepts, while contributing to local community building efforts related to various health issues in the Detroit Metropolitan region.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 360 Responsible Drug Policy  3 Credit Hours
A study of the fundamentals needed for identifying both the appearance and effects of controlled substances. Students receive guides to controlled substances; their color, trade names and drug codes. Topics include a critical examination of the physiological, sociological and legal aspects of drug abuse and the many complexities which have developed as a direct or indirect result of drug policy in society. (OC)

HHS 364 Health Policy and Admin  3 Credit Hours
A survey of the structure and processes of health administration in America, including analysis of current issues in health policy.
HHS 370  Medicine and Addiction I  3 Credit Hours
Medicine and Addiction I is part one in the sequence of introductory coursework in the Addiction Studies Certificate Program. This course provides the clinical orientation for addiction that frames much of the activities associated with screening and assessment of client behaviors as well as aspects of intervention and management of clients with addiction. Students successfully completing the course will identify and apply the assessment principles for individuals and families dealing with addiction. (OC)

HHS 371  Medicine and Addiction II  3 Credit Hours
Medicine and Addiction II is part two in the sequence of introductory coursework in the Addiction Studies Certificate Program. This course provides the clinical orientation for addiction that frames much of the activities associated with screening and assessment of client behaviors as well as aspects of intervention and management of clients with addiction. Students successfully completing the course will identify and apply the treatment principles for individuals and families dealing with addiction. (OC)

Prerequisite(s): HHS 370 or HPS 370

HHS 380  Religion, Medicine, and Health  3 Credit Hours
This interdisciplinary discussion course examines topics and research methods in the historical, sociological, psychological, and anthropological intersections between religion, medicine, and health for its effects on the understanding of illness and disease, health agency, death and dying, and other aspects of the illness experience. (YR)

Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior

HHS 400  Health Policy and Politics  3 Credit Hours
This course will examine the politics of the health policy process, through a critical review of the roles, relationships, motivations, and strategies of key political actors, structures, and institutions that comprise the policymaking process in the United States. The objective is to prepare students to serve as effective policy or political advocates. We will review and discuss conceptual models of policymaking and politics in order to contextualize real-life health policy processes and decisions. (YR)

Prerequisite(s): HHS 300

HHS 401  Methods of Health Promotion  3 Credit Hours
This course is designed to prepare students with skills necessary to implement health education programs within the context of community health settings. Emphasis will be placed on a variety of community health education methods and strategies including but not limited to educational presentations and material development, mass media and media advocacy, legislative action and involvement, community organization, and working with groups. (F,W,S)

Prerequisite(s): CHE 101 or HHS 101 and CHE 201 or HHS 201

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 402  Health & Human Svcs Internship  3 Credit Hours
This internship provides students the opportunity to apply classroom learning and gain hands-on experience inside a public health work environment at the Michigan Department of Community Health. The experience allows students to build valuable networking connections with local and state public health professional leaders as well as explore a career choice within public health. The course focuses on exposure to state and local program analysis while students develop marketable job skills and core public health competencies. (F, W, S)

Prerequisite(s): CHE 101 and HHS 200

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 403  Medical Information Systems  3 Credit Hours
Medical Information Systems deals with how information is created, stored, and used in health care settings. Areas of interest for this course include fundamentals of computers and data management, medical information documentation in the form of paper and electronic medical records, health data privacy issues, disease classification and scoring systems, quality assurance in health care delivery, commonly used health care statistics, reimbursement methodologies, health care monitoring by internal processes and external review agencies, and vital statistics and disease surveillance systems. The course also includes some hands-on computer applications instruction to familiarize students with commonly used software platforms utilized in health care administration. (F,W,S)

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 404  Financing Health & Medical Sys  3 Credit Hours
The American health care system faces two problems: access to health services and high and rising costs. This course looks at the problems of uninsured citizens as well as the strains placed on health care facilities in providing services for them. Europeans have dealt with problems of access and cost controls through universal health care coverage and the course takes up various models in use today. The course also looks at American health insurance and "managed care" programs such as HMOs and PPOs as methods of providing health coverage as well as controlling costs. The course introduces students to services provided by the government including Medicare, Medicaid and State Children's Health Insurance Program (SCHIP). Students will learn the basics of creating a budget under constraints such as contractual limitations and Diagnosis-Related Groups (DRGs).

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 405  Population Health  3 Credit Hours
Population Health is defined as encompassing the health outcomes of a group of individuals as well as the distribution of those outcomes as related to the social determinants of health. Lectures, discussions, and group exercises focus on the impact of composite indicators in relation to population health including medical and health care, policy, genetics, behavior, social structures, and environmental factors. (F, W)

Prerequisite(s): HHS 200 or CHE 101

Restriction(s):
Cannot enroll if Class is Freshman

HHS 406  Program Evaluation  3 Credit Hours
This course will provide an introduction to key concepts in program evaluation. Students will learn about the systematic steps involved in evaluating public programs for efficiency and effectiveness. The course will rely on case studies, text examples, and discussion.
HHS 407 Fundraising & Grantwriting 3 Credit Hours
Full Course Title: Fundraising & Grant-writing in Health & Human Services
This course introduces students to the ways that health and human service programs secure resources to expand and improve their services, reach vulnerable or marginalized populations, and address existing or emerging social conditions. The primary focus of the course is on the development of grantseeking skills, but students will also gain exposure to a variety of fundraising approaches that may be relevant over the course of their career. Students will learn components of effective grant proposals and gain technical knowledge on designing supporting fundraising documents, such as budgets and project timelines. Students will work through a stepwise process to build their own grant proposal for a real or imagined program. Recommended pre-requisites include HHS 360 and/or HHS 460. (YR)
Prerequisite(s): COMP 106
Restriction(s):
Can enroll if Class is Junior or Senior

HHS 410 Quantitative Research & Stats 4 Credit Hours
Full Course Title: Statistics in Health and Human Services An introduction to methods of data collection and analysis. Elementary statistical data are analyzed using computerized statistics programs. A discussion of research design and the philosophy of social science applied to answering health and human service questions.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 412 Principles of Epidemiology 3 Credit Hours
The study of the frequency and distribution, as well as the causes and control, of disease in human populations. Using data analysis tools, one can identify causes of disease and the effects of prevention and treatment. This course is an application of research design to determine the extent of which environment (toxins, for instance), heredity, childhood development, and lifestyle influence morbidity and mortality rates. (F,W,S)
Prerequisite(s): SOC 410 or HPS 410 or HHS 410 or CRJ 410
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 415 Healthcare Administration 3 Credit Hours
This course introduces students to administrative models and skills that can be used at a supervisory level. These concepts include strategic planning, marketing, organizational communications, quality assurance, project management and team skills, supervision and evaluation, conflict resolution and office cultures and politics. A critical and historical perspective is used to understand the origins and meanings of these conceptions and the extent to which they correspond with the service mentality of health and human services. Applications to the health and human services will be central to the course. (F,W,S)
Prerequisite(s): HPS 440 or HHS 440
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 425 Work w/Child in Health Setting 3 Credit Hours
Full Course Title: Working with Children in Healthcare Settings This course is essential for students interested in working in health care settings, with children or pediatric populations, and in particular for persons seeking to become a Certified Child Life Specialist. The course is taught by a Certified Child Life Specialist and focuses on children in the health care environment. Topics of study include: Child Life documents, scope of practice, impact of illness, injury and health care on patients and families, family-centered care, therapeutic play and preparation. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 430 Hlth Behavior & Hlth Education 3 Credit Hours
This course provides an overview of social and behavioral science theories that guide the development of health education and promotion interventions aimed at preventing, reducing, and eliminating public health problems. Part one of the course describes the relationship between behavior and health, through a review of several current health problems faced by people in the United States. Part two presents a survey of health behavior theories ranging from those aimed at individual behavioral change to community health education promotions. The final part of the course looks at the application of theory to real-world health promotion and education interventions. Students will learn how social and behavioral theory informs intervention design, implementation, and evaluation. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 433 Race/Ethnic Health 3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequity—race/ethnicity (including nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy. (OC)

HHS 435 Obesity and the Lifecourse 3 Credit Hours
This course aims to introduce students to the fundamentals of the lifecourse perspective on health, while using “obesity” as a unifying example to illustrate its theoretical linkages to individual and population health, the practical implications for the administration and financing of the health care system, and for framing policy options. The course highlights the differential impact of obesity on (1) the health and socioeconomic achievement of individuals at various stages in the lifecourse; (2) the population health and economic needs or opportunities, as derived from the lifecourse profile of a specific population (i.e., age distribution and aging trends) and in the context of a changing structure of society; and (3) the demand for healthcare services and other stresses on the healthcare system. The course identifies the rationale, goals, scope, design, and potential for successful implementation of obesity-reducing policy interventions at different points during the lifecourse. (F,W,S)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
HHS 436  Reproductive Health Policy  3 Credit Hours
This course provides a comprehensive introduction to the field of reproductive health in the US. Understanding women's reproductive health requires consideration of the intersections of gender, race, class, culture, geography, economic status, and nation within a sociopolitical context. The course introduces students to the historical trends in the regulation of women's fertility and reproductive health. Readings draw from a number of different disciplines, including: law, medical studies, history, social sciences, and personal narratives to critically examine the intent and impact of current standards for reproductive health policy and practice. Topics include: reproductive justice, contraception, pregnancy, reproductive control, and family leave. Course discussions include a focus on health policy and activism to affect change related to women's reproductive health, all within a framework of reproductive justice. A major emphasis is on developing critical thinking skills that can be applied to issues of women's reproductive health in order to educate and empower students to become proactive healthcare consumers. (FWS)
Prerequisite(s): SOC 200 or SOC 201 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303 or WGST 303
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 440  Medical Sociology  3 Credit Hours
An analysis of health and illness behavior from the point of view of the consumer, as well as medical professionals, the structure, strengths and weaknesses of the medical care delivery system in the U.S.; the impact of culture and personality on illness behavior; and a study of the institution of medicine and activities of health care professionals. 
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 442  Medical Ethics  3 Credit Hours
An examination of moral issues in medicine. Among the problems to be considered are truth-telling and paternalism in the doctor-patient relationship, psychosurgery and behavior control, death and euthanasia, the allocation of scarce resources, and genetic counseling and control. Specific attention will be given to ethical theories and to philosophical concepts such as rights, autonomy, and justice.
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 302 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 340 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375 or PHIL 380 or PHIL 390 or PHIL 441 or PHIL 445 or PHIL 485 or PHIL 490
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 448  Comparative Health Care System  3 Credit Hours
An introduction and overview of the English, Swedish, and People's Republic of China health care systems. Focus on cultural and other organizational characteristics, unique features, approaches, and ability to solve problems. Emphasis on how three systems help us understand the American health care system.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 456  Health Care and the Law  3 Credit Hours
A comprehensive study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children's rights, access to health care. The emphasis will be on the organizational and personal consequence of legal requirements. Junior/Senior standing is a requirement. Students cannot receive credit for both HHS/HPS 456 and HHS/HPS 556.
Prerequisite(s): SOC 201 or SOC 200 or POL 364
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

HHS 470  Information Science and Ethics  3 Credit Hours
Technological innovations in how individuals, organizations, and governments collect and share personal information have raised myriad concerns regarding how that information can be best protected. In today's highly networked world, individuals must acquire the knowledge and skills to engage with technologies in a safe and secure manner. This course provides an interdisciplinary exploration of the social, legal, ethical, and design challenges that arise when it comes to securing personal information and helping individuals maintain desired levels of privacy at home, work, and everywhere in between. (YR)
Prerequisite(s): MATH 115 and MATH 116 and (MATH 227 or MATH 217) and (MATH 205 or MATH 219) and CIS 150 and CIS 200 or CCM 200 or IMSE 200

HHS 475  Soc Construct Mental Illness  3 Credit Hours
Full Course Title: Social Construction of Mental Illness This course explores varied cultural descriptions and models of mental illness. By focusing on the ways that culture shapes how people experience, and respond to, mental illness this class explores cultural representations of mental illness, ranging from discrete illness resulting from a chemical imbalance to a profound threat to order. We seek to understand the cultural, personal, and political underpinnings of mental illness and medical practices in societies throughout the world. The course utilizes an interdisciplinary perspective, drawing from multiple sources of information regarding mental health issues including feminism.
Prerequisite(s): SOC 200 or SOC 201 or WGST 303 or ANTH 303 or HUM 303 or SOC 303 or PSYC 303

HHS 480  Arab American Health  3 Credit Hours
This course explores health issues, practices, risk factors, and disease in the Arab world and MENA region, as well as in Arab American communities in the United States and in the State of Michigan. The course focuses on the interaction of culture, geography, and health in the Arab world and the impact of cultural commonalities on the health of the generations of Arab immigrants to the United States. (W)

HHS 490  Topics in Health  1 to 3 Credit Hours
Examination of problems and issues related to Health. Title as listed in Schedule of Classes will change according to specific content. Course may be repeated for credit when specific topics differ.

HHS 490C  Topics in Health  3 Credit Hours
This course provides an overview of health education efforts with women and families, informed by a Maternal and Child Health framework and a life course perspective. Students successfully completing the course will be able to: 1) describe the field of maternal and child health, 2) describe health issues prevalent among both women of childbearing age and children, 3) understand interventions developed to address maternal and child health, and 4) understand how women are engaged in health education efforts targeted to women, children and men. This course will also provide students with means of applying principles in maternal and child health and the life course perspective in health education practice. This course is appropriate for students in Community Health Education, Public Health, Child Life, and Health Policy Studies.
HHS 491  HHS Senior Seminar  3 Credit Hours
Focus on current issues and practical problems faced by persons working in public health, health care organizations, human services delivery, and financing. Use of the case method (where appropriate) to demonstrate and discuss real problems and approaches in functioning institutions in Southeastern Michigan. Taught primarily from the point of view of individuals responsible for administering or advising such institutions. (F,W,S)
Prerequisite(s): HPS 440 or HHS 440 and (HPS 336 or HHS 336 or HPS 364 or HPS 364 or HPS 390 or HPS 401 or HHS 402 or HPS 403 or HPS 404 or HHS 404 or HPS 405 or HPS 415 or HPS 410 or HHS 410 or HPS 412 or HHS 412 or HPS 430 or HHS 430 or HPS 442 or HHS 442 or HPS 448 or HPS 448 or HPS 456 or HHS 456 or HPS 475 or HHS 475 or HPS 498 or HHS 498)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior

HHS 495  Off-Campus Research  1 to 3 Credit Hours
Participation in ongoing research, and/or field experience at an off-campus laboratory, clinical, health, healthcare facility, or field site. Arrangements are made between the site, the student, the pre-health advisor, faculty member, and/or the academic advisor(s). Four to twelve hours laboratory or site experience attendance per week. Permission of advisor required. (F,W,S)

HHS 498  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. (F,W,S)

HHS 499  Independent Study  1 to 3 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor, which shall not duplicate a formal course offering. (F,W,S)

HHS 501  HHS Internship  3 Credit Hours
The Health and Human Services Internship is an academic, curriculum-based practical work experience in a health care setting, health insurance firm, or health policy agency that provides students with hands-on experience to enhance understanding of issues relevant to health policy and health service delivery. The internship is normally unpaid and, when taken as a three credit hour course, consists of 8 hours per week of field work over a 14-week semester. Students are required to attend an internship seminar that meets weekly and includes a series of lectures on organizational, ethical, and administrative topics, intended to link the work experience with students prior coursework. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 503  Medical Information Systems  3 Credit Hours
Medical Information Systems deals with how information is created, stored and used in health care settings. Areas to interest for this course include fundamentals of computers and data management, medical information documentation in the form of paper and electronic medical records, health data privacy issues, disease classification and scoring systems, quality assurance in health care delivery, commonly used health care statistics, reimbursement methodologies, health care monitoring by internal processes and external review agencies, and vital statistics and disease surveillance systems. The course also includes some hands-on computer applications instruction to familiarize students with commonly used software platforms utilized in health care administration. Students cannot receive credit for both HHS 403 or HPS 403 and HHS 503 or HPS 503. (F,W,S)
Prerequisite(s): HHS 440 or HHS 540 or HPS 440 or HPS 540
Restriction(s):
Can enroll if Level is Graduate

HHS 504  Financing Health & Medical Sys  3 Credit Hours
Full Course Title: Financing Health & Medical Systems The American health care system faces two problems: access to health services and high and rising costs. This course looks at the problems of uninsured citizens as well as the strains placed on health care facilities in providing services for them. Europeans have dealt with problems of access and costs controls through universal health care coverage and the course takes up various models in use today. The course also looks at American health insurance and “managed care” programs such as HMOs and PPOs as methods of providing health coverage as well as controlling costs. The course introduces students to services provided by the government including Medicare, Medicaid and State Children’s Health Insurance Program (SCHIP). Students will learn the basics of creating a budget under constraints such as contractual limitations and Diagnosis-Related Groups (DRGs). Students Cannot receive credit for more than one of the following: HHS 404, HPS 404, HHS 504, or HPS 504. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 506  Program Evaluation  3 Credit Hours
This course will provide an introduction to key concepts in program evaluation. Students will learn about the systematic steps involved in evaluating public programs for efficiency and effectiveness. The course will rely on case studies, text examples and discussion. This course is the graduate equivalent of HHS 406. Graduate students enrolled in this course will produce a paper that is substantively different with increased requirements than the paper produced by undergraduates enrolled in HHS 406. In addition, graduate student examinations will require deeper responses that focus on synthesizing both text and journal article materials. (OC)
Restriction(s):
Can enroll if Class is Graduate

HHS 510  Quantitative Research & Stats  4 Credit Hours
An introduction to methods of data collection and analysis. Also a discussion of research design and the philosophy of social sciences. Additional reading assignments or projects will distinguish this course from its undergraduate version HHS 410. Students cannot receive credit for both HHS 410 and HHS 510. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Graduate
HHS 512  Principles of Epidemiology  3 Credit Hours
The study of frequency and distribution, as well as the causes and control, of disease in human populations. Using data analysis tools, one can identify causes of disease and the effects of prevention and treatment. This course is an application of research design to determine the extent to which environment (toxins, for instance), heredity, childhood, development, and lifestyle influence morbidity and mortality rates. Graduate students' work will include re-analyzing original data in a confirmatory, in contrast to exploratory mode. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 515  Healthcare Administration  3 Credit Hours
This course introduces students to administrative models and skills that can be used at a supervisory level. These conceptions include strategic planning, marketing, organizational communications, quality assurance, project management and team skills, supervision and evaluation, conflict resolution and office cultures and politics. A critical and historical perspective is used to understand the origins and meanings of these conceptions and the extent to which they correspond with the service mentality of health and human services. Applications to the health and human services will be central to the course. Students cannot receive credit for both HHS 415 or HPS 405 and HHS 515 or HPS 505. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 530  Health Behavior & Health Educ  3 Credit Hours
Full Course Title: Health Behavior & Health Education This course provides an overview of social and behavioral science theories that guide the development of health education and promotion interventions aimed at preventing, reducing, and eliminating public health problems. Part one of the course describes the relationship between behavior and health, through a review of several current health problems faced by people in the United States. Part two presents a survey of health behavior theories ranging from those aimed at individual behavioral change to community health education promotions. The final part of the course looks at the application of theory to real-world health promotion and education interventions. Students will learn how social and behavioral theory informs intervention design, implementation, and evaluation. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 533  Race/Ethnic Health  3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequity-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy. (OC)

HHS 540  Medical Sociology  3 Credit Hours
An analysis of health and illness behaviors from the point of view of the consumer, as well as the medical professionals, the structure, strengths, and weaknesses of the medical care delivery system in the U.S; the impact of culture and personality on illness behavior; and a study of the institution of medicine and activities of health care professionals. Additional reading assignments or projects will distinguish this course from its undergraduate version HHS 440. Students cannot receive credit for both HHS 440 or HPS 440 and HHS 540 or HPS 540. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Graduate

HHS 542  Medical Ethics  3 Credit Hours
Issues in medical ethics are among the most urgent facing the world today. This course will explore some of these issues, the relationship between patient and health caregiver (truth-telling, informed consent, the right to refuse treatment, confidentiality); assisted suicide and euthanasia; treatment of defective newborns; scarce resources, social justice and the right to health care; cloning and genetic manipulation; new reproductive technologies; and others. We will discuss issues from the standpoint of patients, medical stressed. Students cannot receive credit for both HHS 442 or HPS 442 and HHS 542 or HPS 542. Prerequisite: any previous course in Philosophy or permission of instructor. (F,W)
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 340 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIIL 371 or PHIL 375
Restriction(s):
Can enroll if Level is Graduate

HHS 548  Comparative Health Care Sys  3 Credit Hours
An introduction and overview of the English, Swedish, and People's Republic of China health care systems. Focus on cultural and other organizational characteristics, unique features, approaches and ability to solve problems. Emphasis on how the three systems help us understand the American health care system. Additional reading assignments or projects will distinguish this course from its undergraduate version HHS 448 or HPS 448 and HHS 548 or HPS 548. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Level is Graduate

HHS 556  Health Care and the Law  3 Credit Hours
A sociological study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children's rights, access to health care. The emphasis will be on the organizational and personal consequences of legal requirements. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both HHS 456 or HPS 456 and HHS 556 or HPS 556. (F,S,W)
Prerequisite(s): SOC 200 or SOC 201 or POL 364
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate
HHS 570  Data Science and Ethics  3 Credit Hours
Technological innovations in how individuals, organizations, and governments collect and share personal information have raised myriad concerns regarding how that information can be best protected. In today's highly networked world, individuals must acquire the knowledge and skills to engage with technologies in a safe and secure manor. This course provides an interdisciplinary exploration of the social, legal, ethical, and design challenges that arise when it comes to securing personal information and helping individuals maintain desired levels of privacy at home, work, and everywhere in between. Graduate students interact with a local agency and produce a paper regarding a relevant security issue. Students may not receive credit for both HHS 470 and HHS 570. (OC)
Prerequisite(s): MATH 115 and MATH 116 and (MATH 227 or MATH 217) and (MATH 205 or MATH 215) and CIS 150 and MATH 200 or CIS 200 or ECE 200

HHS 591  Graduate Seminar  3 Credit Hours
Seminar focuses on current issues and practical problems in health care organization, delivery, and financing. The Case Method (where appropriate) is used to demonstrate and discuss real problems and approaches in functioning health care institutions in Southeastern Michigan. The course is primarily from the point of view of individuals responsible for administering or advising institutions. Students cannot receive credit for both HPS 402 or HHS 491 and HPS 502 or HHS 591. (F,W,S)
Prerequisite(s): HHS 440 or HHS 540 or HPS 440 or HPS 540
Restriction(s):
Can enroll if Level is Graduate

HHS 690  Graduate Research  3 Credit Hours
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project's completion. (A maximum of 3 credit hours of research course work may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Class is Graduate

HHS 691  Topics in Health IT  3 Credit Hours
This is a graduate seminar focused on the latest developments in Health Information Technology. Topics Vary. See schedule of classes for current offerings. May be elected more than once if topics differ.
Restriction(s):
Can enroll if Class is Graduate

HHS 692  Graduate Internship  3 Credit Hours
The internship provides real-world experience for students in a professional environment. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and evaluation documents at the end of each work assignment and participate in an assessment session with the internship staff. (A maximum of 3 credit hours of internship course work may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Class is Graduate

Health Policy Studies
Students will explore the economics and politics of health care delivery, sociological perspectives on health, cross-cultural comparisons of health care systems, ethical considerations, and practical work in aspects of the American health care and health policy systems. The minor is intended for students interested in health services administration, health policy and planning, and such medical professions as medicine, dentistry and nursing.

Minor Requirements
Students interested in completing the health policy studies minor must complete a total of 15 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>HHS 336</td>
<td>Perspectives in Women's Health</td>
<td>3</td>
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<tr>
<td>HHS 364</td>
<td>Health Policy and Admin</td>
<td>3</td>
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<tr>
<td>HHS 402</td>
<td>Health and Human Services Internship</td>
<td>3</td>
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<td>HHS 403</td>
<td>Medical Information Systems</td>
<td>3</td>
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<tr>
<td>HHS 404</td>
<td>Financing Health &amp; Medical Sys</td>
<td>3</td>
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<tr>
<td>HHS 410</td>
<td>Quantitative Research</td>
<td>4</td>
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<tr>
<td>HHS 412</td>
<td>Principles of Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>HHS 415</td>
<td>Healthcare Administration</td>
<td>3</td>
</tr>
<tr>
<td>HHS 430</td>
<td>Hlth Behavior &amp; Hlth Education</td>
<td>3</td>
</tr>
<tr>
<td>HHS 435</td>
<td>Obesity and the Lifecourse</td>
<td>3</td>
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<tr>
<td>HHS 436</td>
<td>Reproductive Health Policy</td>
<td>3</td>
</tr>
<tr>
<td>HHS 440</td>
<td>Medical Sociology</td>
<td>3</td>
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<tr>
<td>HHS 442</td>
<td>Medical Ethics</td>
<td>3</td>
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<tr>
<td>HHS 448</td>
<td>Comparative Health Care System</td>
<td>3</td>
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<tr>
<td>HHS 456</td>
<td>Health Care and the Law</td>
<td>3</td>
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<tr>
<td>HHS 475</td>
<td>Soc Construct Mental Illness</td>
<td>3</td>
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<tr>
<td>HHS 491</td>
<td>HHS Senior Seminar</td>
<td>3</td>
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Instructional Technology
Program Description
The Bachelor of Arts in Instructional Technology prepares students with regards to developing the knowledge and skills to be able to improve the learning and performance of individuals by using technology across a broad spectrum of employment settings.

This program is also consistent with the mission of the newly formed College of Education, Health and Human Services (CEHHS) with its commitment to excellence rooted in strong academics, innovative research and engaged learning. Students will have the opportunity to engage in real-world learning experiences through internships in professional settings. The curriculum outlined for the undergraduate degree in instructional technology provides students with a choice of a focus in either health informatics or education.

Digital technology is a key factor in almost every industry, business, educational setting and health care environments. Instructional technologists are needed in work places to train employees to use technology efficiently, to learn to use and apply new technologies as they emerge and to create training materials. Therefore, a wide variety of
jobs are available for a student with a major in instructional technology including:

- Instructional Designer
- Training Developer
- Computer User Support
- Web-based Training

Instructional Technology is a field concerned with improving the efficiency and effectiveness of learning, performance improvement, and instructional delivery by using appropriate technology. The programs goals include:

- Design instruction using needs assessment
- Apply learning theory to instructional design
- Select a delivery system for the specific learning environment
- Integrate instruction with other factors that influence human performance
- Use technology in support of the development and delivery of instruction

4+1 Educational Technology Accelerated Program
The Master of Arts in Educational Technology Accelerated Program, or 4+1 program, is designed for undergraduate students in the Instructional Technology major who have the interest, and demonstrated ability, to pursue the MA in Educational Technology. The program is designed to allow students who complete the BA in Instructional Technology to fulfill the requirements of the MA in Educational Technology with one additional year of graduate study. This will be achieved by combining a portion of undergraduate and graduate coursework as described below.

Eligibility
To be eligible for the program, a student must:

- Be enrolled in the undergraduate Instructional Technology program at the University of Michigan-Dearborn.
- Have a 3.0 cumulative GPA or better.
- Have earned at least 60 credits at the undergraduate level.

Double Counting Credits
1. The 4+1 Masters program allows current UM-Dearborn undergraduate Instructional Technology majors to complete both the BA in Instructional Technology and MA in Educational Technology degrees in an accelerated format. 4+1 students can double-count up to 15 credits of 500-level or above courses. Double-counting these 15 credits between the BA in Instructional Technology and MA in Educational Technology saves students a total of 5 classes. The courses eligible to be double-counted include: EDT 501, 502, 510, 514, 520, 522.  

2. At least one additional year of graduate work (at least 15 credits) would be needed to complete the Master’s program.

3. The double-counted classes appear on both the undergraduate and graduate transcripts. Students are graded based on the graduate grading scheme for all graduate courses elected. Only graduate level courses can be double counted towards both the undergraduate and graduate degree. Students are not allowed to count undergraduate coursework towards a graduate degree.

Please see the College's website (https://umdearborn.edu/cehhs/graduate-programs/areas-study/ma-educational-technology-online/41-educational-technology-accelerated-program/) for admission requirements and program details.

**Dearborn Discovery Core Requirement**
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Prerequisites (6 Cr. Hrs.)**

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<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>SPEE 101</td>
<td>Principles of Speech Comm</td>
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Total Credit Hours 6
Core Requirements (10 Cr. Hrs)

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<tr>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
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<tr>
<td>COMP 280</td>
<td>Business Writing &amp; Rhetoric</td>
<td>3</td>
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<tr>
<td>MATH 104</td>
<td>College Algebra</td>
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<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
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Additional hours are required to meet all of the Dearborn Discovery Core Requirements

Total Credit Hours: 10

Major Requirements (45 Cr. Hrs.)

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</thead>
<tbody>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>EDT 401</td>
<td>Res, Trends,&amp;Issues in Ed Tech</td>
<td>3</td>
</tr>
<tr>
<td>EDT 402</td>
<td>Survey of Educ Tech Tools</td>
<td>3</td>
</tr>
<tr>
<td>EDT 410</td>
<td>Teaching with Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDT 414</td>
<td>Application of Instrl Design</td>
<td>3</td>
</tr>
<tr>
<td>EDT 420</td>
<td>Intro Teaching Learning Online</td>
<td>3</td>
</tr>
<tr>
<td>EDT 422</td>
<td>Educating the Digital Learner</td>
<td>3</td>
</tr>
<tr>
<td>EDT 430</td>
<td>Assistive Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDT 462</td>
<td>Instructional Technology Internship</td>
<td>3</td>
</tr>
<tr>
<td>EDC 400</td>
<td>Adult Learning:Theory/Practice</td>
<td>3</td>
</tr>
<tr>
<td>HHS 470</td>
<td>Information Science and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>JASS 403</td>
<td>Issues in Cyberspace</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 36

Students admitted to the 4+1 Educational Technology Accelerated Program may substitute a maximum of 15 credits of courses from the following: EDT 501 for EDT 401, EDT 502 for EDT 402, EDT 510 for EDT 410, EDT 514, for EDT 414, EDT 520 for EDT 420, EDT 522 for EDT 422.

Specialization Courses: Choose three courses (9-10 Cr. Hrs.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 317</td>
<td>Case Studies in Tech Writing</td>
<td>3</td>
</tr>
<tr>
<td>GEOI 305</td>
<td>Intro to GIS</td>
<td>4</td>
</tr>
<tr>
<td>GEOI 305</td>
<td>Intro to GIS Lab</td>
<td>3</td>
</tr>
<tr>
<td>HHS 403</td>
<td>Medical Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>HHS 406</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>JASS 303</td>
<td>Media Design &amp; Animation</td>
<td>3</td>
</tr>
<tr>
<td>JASS 315</td>
<td>Media Productn for Metro Comm</td>
<td>3</td>
</tr>
<tr>
<td>JASS 405</td>
<td>New and Emerging Media</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours for the Major: 45

Electives

Additional Electives will be required to meet minimum credit hours for graduation. Please refer to Dearborn Discovery Core requirements to ensure these are met.

Total Hrs. for Degree: 120 total credit hours required for graduation.

Program Notes:
1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. The minimum grade point average requirement for program completion is 2.0 cumulative and 2.0 in major.
3. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog and is expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.
4. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
5. Must meet Dearborn Discovery Core Requirements see umdearborn.edu/696973/ for details.

K-8 STEM2 Teaching Certificate

The K-8 STEM$^2$ Teaching Certificate is designed to enhance students’ content knowledge in science, technology, engineering, mathematics and medicine, to be able to use best pedagogical practices for teaching K-8 STEM$^2$ lessons, and to successfully integrate the STEM$^2$ disciplines into lessons and units.

CEHHS students in the elementary certification program elect one content area for a major with about 20% selecting either science or mathematics. The new certificate provides students with the opportunity to take additional coursework in engineering, STEM education, health related courses, as well as science or mathematics. While the UM-Dearborn K-8 STEM$^2$ Teaching Certificate does not lead to a state endorsement, it will provide evidence of the additional preparation in STEM$^2$ for K-8 teachers.

The certificate consists of 15 undergraduate credit hours, including the newly developed EXPS 400: STEM$^2$ Teaching and Learning. Students will participate in exemplary examples of STEM$^2$ curricula and learn how to integrate the STEM$^2$ disciplines within lessons and units for K-8 students.

Program Goals

The UM-Dearborn K-8 STEM$^2$ Teaching Certificate has the following goals for students in the program. Students are:
1. Knowledgeable in the content, skills and practices of the STEM$^2$ disciplines.
2. Knowledgeable in the use of pedagogy to integrate the STEM$^2$ disciplines into effective lessons and units.
3. Prepared to be effective educators in K-8 STEM$^2$ teaching.

To view application forms and admission information, please click here (https://umdearborn.edu/cehhs/professional-development-training/certificates/undergraduate-certificate-programs/).

Certificate Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>6</td>
</tr>
</tbody>
</table>

Required Courses: ENGR 100 Intro to Eng and Computers
Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Core Course Requirements

Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.
A minimum of 37 semester hours from the following:

**Major Requirements**

A minimum of 37 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elem Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 231</td>
<td>Inquiry: Physical Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 232</td>
<td>Inquiry: Earth/Planet Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 233</td>
<td>Inquiry: Life Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 42

1. Two of the three NSCI core courses may be transferred to UM-Dearborn. A) an introductory physical science will satisfy NSCI 231, B) an introductory earth/planetary science will satisfy NSCI 232, and C) an introductory life science course will satisfy NSCI 233.

**Pre-Professional Requirements**

Pre-professional courses are generally completed in the freshman and sophomore year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 205</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDF 450</td>
<td>Hlth, Nutr, &amp; PE/Clsm Tchr</td>
<td>2</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Soltn</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 250</td>
<td>Elem Ed Vis &amp; Perf Arts</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 407</td>
<td>Inquiry-based Math and Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 21

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDC 476</td>
<td>Literacy Assessmt for Instr</td>
<td>4</td>
</tr>
<tr>
<td>EDD 447</td>
<td>Tchg English as Second Lang</td>
<td>1</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract. Tchg Engl Secnd Lang (Optional)</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 461</td>
<td>Modern English Grammar</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 475</td>
<td>Issues Lit Child/Vng People</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>LING 280</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>LING 475</td>
<td>Lang Diversity: Arab Amer Comm</td>
<td>3</td>
</tr>
<tr>
<td>or LING 477</td>
<td>African American English</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 223</td>
<td>Intro to Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 327</td>
<td>Advanced Exposition</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 482</td>
<td>History of the English Lang</td>
<td>3</td>
</tr>
<tr>
<td>LING 475</td>
<td>Lang Diversity: Arab Amer Comm</td>
<td>3</td>
</tr>
<tr>
<td>LING 477</td>
<td>African American English</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 38

**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.

2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.

3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.

4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.

5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

6. The minimum number of semester hours required to graduate is 128.

7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

8. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details

**Mathematics Studies**

Are you ready to help students become problem solvers?

Do you want to help children learn mathematics with understanding? A bachelor’s degree in Mathematics Studies will prepare you to support students who reason about mathematical ideas rather than rely on rules and procedures.

Our program will ready you to become a classroom teacher for all students who reason about mathematical ideas rather than rely on rules and procedures.

With successful completion of the program, you will earn both a bachelor’s degree and faculty recommendation for the Michigan Elementary Standard Certificate.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Core Course Requirements**
Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 220</td>
<td>Science in the Elem School</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 282</td>
<td>History &amp; Civics Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 283</td>
<td>Geography &amp; Econ Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

**Required for Early Childhood and Special Education Majors**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LING 280</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 231</td>
<td>Inquiry: Physical Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 232</td>
<td>Inquiry:Earth/Planet Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 233</td>
<td>Inquiry: Life Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 42

1. Two of the three NSCI core courses may be transferred to UM-Dearborn. A) an introductory physical science will satisfy NSCI 231, B) an introductory earth/planetary science will satisfy NSCI 232, and C) an introductory life science course will satisfy NSCI 233.

**Pre-Professional Requirements**
Pre-professional courses are generally completed in the freshman and sophomore year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 205</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
</tbody>
</table>

Required for Early Childhood and Special Education Majors only

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDF 450</td>
<td>Hlth, Nutr, &amp; PE/Clsm Tchrs</td>
<td>2</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 250</td>
<td>Elem Ed Vis &amp; Perf Arts</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 407</td>
<td>Inquiry-based Math and Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Required for Early Childhood Majors only

Total Credit Hours 21

**Major Requirements**
A minimum of 30 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104 or MATH 105</td>
<td>College Algebra or Pre-Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 113 or MATH 115</td>
<td>Calc I for Biology &amp; Life Sci or Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 442</td>
<td>Geometry for Teachers</td>
<td>3</td>
</tr>
</tbody>
</table>
Program Notes:

1. MATH 104 and MATH 113 are the recommended pre-calculus and calculus courses for elementary education students with a mathematics major or minor.

2. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.

3. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.

4. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.

5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.

6. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

7. The minimum number of semester hours required to graduate is 128.

8. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

9. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details.

Minor Requirements

A minimum of 20 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>Pre-Calculus</td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elemen Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 442</td>
<td>Geometry for Teachers</td>
<td>3</td>
</tr>
</tbody>
</table>

Recommended Electives

Select 4-6 credit hours:

- MATH 131 Conceptual Mathematics
- MATH 227 Introduction to Linear Algebra
- MATH 300 Math Lang Proof & Struct
- MATH 297 The Nature of Mathematics
- MATH 391 Topics in Mathematics Edu
- MATH 444 Data Anlys,Prob&Stat forTchrs
- MATH 445 Number & Prop'l Rsng for Tchrs
- MATH 446 Discrete Math/Modeling for Tch
- MATH 447 Micro in Math for Teachers
- STAT 263 Introduction to Statistics
- or other courses approved by Academic Advisor

Total Credit Hours 30-32

Program Notes:

1. A minimum GPA of 2.75 is required for a minor.

2. For the minor 6 or more semester hours must be at the 300 level or above.

3. MATH 104 and MATH 113 are the recommended pre-calculus and calculus courses for elementary education students with a mathematics major or minor.

4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once a year and in the term prior to graduation.

5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

6. In order to be recommended for endorsements, students must pass the appropriate MTTC exam in addition to completing the coursework.

7. MTTC test scores must be reported by electronic delivery or direct mail from Pearson Evaluation Systems to the University of Michigan-Dearborn College of Education, Health, and Human Services. No hand carried scores will be accepted.

Post-Degree Programs

Application forms for any post-degree program can be obtained from the College of Education, Health, and Human Services Office of Student Success (262 FCS) or online at [http://catalog.umd.umich.edu/undergraduate/college-education-health-human-services/post-degree-programs/%20http://umdearborn.edu/cehhs/cehhs_post_cert.html](http://umdearborn.edu/cehhs/cehhs_post_cert.html).

Standard Teaching Certificate Renewals

The Standard Teaching Certificate is a five-year teaching certificate with unlimited renewals. Each renewal adds five years to the certificate’s validity. A renewal can be requested any time after January 1 of the expiration year. Please visit the Michigan Department of Education webpage for the most current information on requirements for renewing the standard teaching certificate.
Progressing to the Professional Teaching Certificate

Holders of a Standard Teaching Certificate may advance to the Professional Teaching Certificate. The Professional Teaching Certificate is a five-year teaching certificate with unlimited renewals. Each renewal adds five years to the certificate’s validity. A renewal can be requested any time after January 1 of the expiration year.

Please visit the Michigan Department of Education webpage for the most current information on requirements for advancing to the Professional Teaching Certificate or this webpage for the most current information on requirements for renewing the Professional Teaching Certificate.

Certification Only Program (Elementary-COE, Secondary-COS)

Candidates with a degree from an accredited institution and wishing to earn a Michigan Elementary or Secondary Standard Teaching Certificate, must meet the following requirements for these programs:

1. A bachelor’s degree from an accredited institution is required. Students must have a 2.75 GPA overall and in their Elementary or Secondary major and minor (Secondary Only) to be admitted to the College of Education, Health, and Human Services teacher certification program. Once admitted to the teacher certification program, students must continue to maintain a 2.75 GPA.

2. To be eligible for directed teaching (student teaching), students must pass the relevant MTTT test: Elementary Education Test (#103) for seekers of elementary certification; the major MTTT test for seekers of secondary certification.

3. When the desired major/optional minor is incomplete and/or the GPA for the major and/or optional minor is between 2.50 and 2.74, a minimum of 12 semester hours for the major and nine (9) semester hours for a minor must be completed with UM-Dearborn courses and the cumulative GPA must be 2.75 or better.

4. Potential candidates must observe established procedures in having their credentials evaluated for the certification program. Request forms are available in the College of Education, Health, and Human Services Office of Student Success. Credentials are evaluated for acceptable majors, optional minors, and those supplementary courses, required by the program.

5. At least two practica at UM-Dearborn shall be required of all COE/COS students prior to student teaching.

6. A maximum of six semester hours (non-UM-Dearborn courses) will be accepted, if applicable, toward the professional studies sequence, not including directed teaching or seminar. The cumulative GPA in the professional sequence must be 2.75 or better. No community college courses can be used for credit in the EDD (methods) sequence of required courses. Grades earned in professional studies sequence courses must observe the criteria established for directed teaching eligibility.

7. When there is evidence to warrant an adjustment in requirements for an admitted COE/COS student, the Professional Standards Committee will act accordingly. Students desiring re-evaluations may use the established petition process.

8. To be eligible for certification, students must have acceptable scores from the Michigan Tests for Teacher Certification Subject Area Tests for every major, optional minor and endorsement desired.

9. No credit toward program is allowable for ROTC and/or physical education.

10. Foreign transcripts must be evaluated by:

11. An English language proficiency test may be required for non-native English speakers.

12. For all practica and student teaching, the following are required:

   a. CPR and First Aid Certification (Adult/Infant/Child)
   b. Bloodborne Pathogens and Infectious Diseases Training
   c. Criminal background check consent form
   d. Video Recording consent form

   Individuals entering this program are required to meet the basic certification requirements at the time they are admitted, and which are appropriate for the particular certificate desired. To enroll, it is necessary to apply for admission to the UM-Dearborn as a “Certification Only Student,” through the College of Education, Health, and Human Services. Application forms are available online at https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/post-degree-certification-application (https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/post-degree-certification-application/).

Students holding degrees from international institutions must have their credentials evaluated, course by course, with a posted grade point average from one of the following evaluators:

Educational Credential Evaluators, Inc.
PO Box 514070
Milwaukee, WI 53203-3470
https://www.ece.org
Telephone: (414) 289-3400

or

World Evaluation Services
Bowling Green Station
PO Box 5087
New York NY 10274-5087
http://www.wes.org/support/
Telephone: (212) 966-6311

Professional Education Certification Program (PEC)

The Professional Education Certificate Program is for persons with a Michigan Standard Teaching Certificate wishing to obtain a renewal of their Standard Teaching Certificate or upgrade to the Professional Teaching Certificate. Application forms for this program are available online at https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/post-degree-certification-application (https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/post-degree-certification-application/).

Curriculum

Certified teachers can qualify for a renewal of their Standard Teaching Certificate or upgrade to the Professional Teaching Certificate (if all other State of Michigan requirements are met) by completing the 6 semester hour post-degree program offered at UM-Dearborn through the College of Education, Health, and Human Services. This program is ideal for the working teacher who wants to maintain a valid teaching credential but is not interested in pursuing a graduate degree.
The Professional Education certificate program is tailor-made to fit the particular professional needs and goals of the individual teacher. To meet residency requirements, students must satisfactorily complete at least 3 semester hours of advisor-approved courses in a planned 6-hour program. The entire course of study, however, can be completed at UM-Dearborn by attending classes during late afternoons, early evenings, summers, and in some cases, in online courses.

**Admission**

1. Admission to this post-degree program (PEC) requires formal application to the program, a Michigan Standard Teaching Certificate, and an approved bachelor’s degree. Official copies of transcripts and a copy of the teaching certificate are required.
2. The plan of study is agreed upon with an advisor who will meet regularly with the student to advise and monitor progress of the 6 semester hour plan of work. It is the student’s responsibility to make annual appointments with the advisor.
3. Correspondence courses may not be used in this program for either renewal or continuing certification.
4. Workshops, online courses from other universities, and conferences offering graduate credit must be approved by the Professional Standards Committee prior to enrollment.
5. When the Professional Education Certification Program is being used to earn an additional major/minor or endorsement all required coursework for the major, minor, or endorsement must be completed prior to recommendation. Also, the Michigan Tests for Teacher Certification (MTTC) Subject Area Test must be taken and acceptable scores achieved prior to recommendation.

**Enhancement Program (EP)**

This program (EP) is for persons with a Michigan Standard or Professional Teaching Certificate who wish to enhance their certificate with an additional major, minor, or endorsement. Individuals entering this program are required to meet all requirements leading to the desired additional endorsement on their teaching certificate. Additionally, the MTTC Subject Area Test must be taken and acceptable scores achieved before a recommendation can be made to the state. Application forms are available online at https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/post-degree-certification-application/. For a full list of majors, minors, and endorsements available, please visit https://umdearborn.edu/cehhs/professional-development-training/post-degree-certification/.

**Pre-Professional Health Certificate**

This certificate assists students who plan or are preparing to apply to post bachelor’s degree pre-professional health schools and programs. The Pre-Professional Health Studies certificate creates the opportunity to take additional courses viewed as valuable by professional schools and appearing in testing processes that exist in addition to programs in mathematics and the sciences.

These courses and learning opportunities provide additional experiences and diverse content for students interested in preparing for application and admission to professional schools including dentistry, medicine, optometry, pharmacy, psychology, and other health careers such as occupational and physical therapy.

The courses included target specific learning outcomes that are designed to add to student success in professional application and testing requirements that exist in addition to traditional natural science and mathematics coursework.

**Program Goals**

Students will:

1. Demonstrate an understanding of the organization and delivery of health and healthcare services.
2. Demonstrate in both written and verbal formats the ability to correctly use terms relating to medical care, clinical procedures, laboratory and diagnostic tests, and common therapeutic procedures, and addiction OR the vocabulary, diagnostic categories, and major categories of mental health and illnesses.
3. Explain the social demography of health and illness in relation to the measurement and determinants of health, prevention and illness.
4. Identify and explain relevant ethical and legal issues and decisions in the delivery of health and healthcare services toward the maintenance of individual and population health.
5. Apply basic terms, principles, and methodology of program evaluation to health and human services programs and service delivery.

**Required Courses (15 credit hours)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPS 440</td>
<td>Medical Sociology</td>
<td>3</td>
</tr>
<tr>
<td>or HPS 456</td>
<td>Health Care and the Law</td>
<td></td>
</tr>
<tr>
<td>HPS 442</td>
<td>Medical Ethics</td>
<td>3</td>
</tr>
<tr>
<td>HHS 406</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>CHE 201</td>
<td>Medical Terminology</td>
<td>3</td>
</tr>
<tr>
<td>or HHS 202</td>
<td>Mental Health Terminology</td>
<td></td>
</tr>
<tr>
<td>HHS 370</td>
<td>Medicine and Addiction I</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 15

**Optional Internship (3 credit hours)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPS 401</td>
<td>Health Pol Studies Internship</td>
<td>3</td>
</tr>
<tr>
<td>or CHE 402</td>
<td>Internship CHE</td>
<td></td>
</tr>
<tr>
<td>or HHS 402</td>
<td>Health and Human Services Internship</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 3

**Public Health**

The multidisciplinary field of public health is committed to preserving, protecting, and promoting the health of individuals, populations, and the communities where they live, learn, work, and play. Public health professionals employ a wide range of tools to prevent disease and illness, improve physical and mental health outcomes, and ensure health equity.

Students who complete the public health minor select courses that allow them to develop such practical skills as health education and communication, community organizing, epidemiology, program planning and evaluation, fundraising, grant writing, and public policy formation.
Minor Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHS 200</td>
<td>Introduction to Public Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 300</td>
<td>Intro to Health Policy</td>
<td>3</td>
</tr>
<tr>
<td>HHS 306</td>
<td>Program Plan Implementation</td>
<td>3</td>
</tr>
<tr>
<td>HHS 311</td>
<td>Work w/Vulnerable Populations</td>
<td>3</td>
</tr>
<tr>
<td>HHS 336</td>
<td>Perspectives in Women’s Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 350</td>
<td>Comm Organizing for Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 364</td>
<td>Health Policy and Admin</td>
<td>3</td>
</tr>
<tr>
<td>HHS 380</td>
<td>Religion, Medicine, and Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 400</td>
<td>Health Policy and Politics</td>
<td>3</td>
</tr>
<tr>
<td>HHS 401</td>
<td>Methods of Health Promotion</td>
<td>3</td>
</tr>
<tr>
<td>HHS 403</td>
<td>Medical Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>HHS 404</td>
<td>Financing Health &amp; Medical Sys</td>
<td>3</td>
</tr>
<tr>
<td>HHS 405</td>
<td>Population Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 407</td>
<td>Fundraising &amp; Grantwriting</td>
<td>3</td>
</tr>
<tr>
<td>HHS 410</td>
<td>Quantitative Research</td>
<td>3</td>
</tr>
<tr>
<td>HHS 412</td>
<td>Principles of Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>HHS 415</td>
<td>Healthcare Administration</td>
<td>3</td>
</tr>
<tr>
<td>HHS 430</td>
<td>Hlth Behavior &amp; Hlth Education</td>
<td>3</td>
</tr>
<tr>
<td>HHS 433</td>
<td>Race/Ethnic Health</td>
<td>3</td>
</tr>
<tr>
<td>HHS 435</td>
<td>Obesity and the Lifecourse</td>
<td>3</td>
</tr>
<tr>
<td>HHS 436</td>
<td>Reproductive Health Policy</td>
<td>3</td>
</tr>
<tr>
<td>HHS 440</td>
<td>Medical Sociology</td>
<td>3</td>
</tr>
<tr>
<td>HHS 442</td>
<td>Medical Ethics</td>
<td>3</td>
</tr>
<tr>
<td>HHS 448</td>
<td>Comparative Health Care System</td>
<td>3</td>
</tr>
<tr>
<td>HHS 456</td>
<td>Health Care and the Law</td>
<td>3</td>
</tr>
<tr>
<td>HHS 470</td>
<td>Information Science and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>HHS 475</td>
<td>Soc Construct Mental Illness</td>
<td>3</td>
</tr>
<tr>
<td>HHS 480</td>
<td>Arab American Health</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credit Hours</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

Reading

Empower students with the skills that will support them in all of their future educational opportunities.

A bachelor's degree in Reading with elementary teacher certification will prepare you to become a classroom teacher for all subjects in grades K-5; or, become certified to teach developmental/remedial reading classes upon meeting the endorsement requirements. Either way, you’ll be ready to work with diverse learners with a program that combines academic studies, professional training and multiple field experiences in local schools.

With successful completion of the program, you will earn both a bachelor's degree and faculty recommendation for the Michigan Elementary Standard Certificate.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Core Course Requirements

Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 220</td>
<td>Science in the Elem School</td>
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</tr>
<tr>
<td>EXPS 282</td>
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<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
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</table>
A minimum of 32 semester hours from the following:

### Major Requirements

A minimum of 32 semester hours from the following:

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<td>EDA 205</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
<tr>
<td>EDC 240</td>
<td>Psych: Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDF 450</td>
<td>Hlth, Nutr, &amp; PE/Clsrm Tchns</td>
<td>2</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 250</td>
<td>Elem Ed Vis &amp; Perf Arts</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 407</td>
<td>Inquiry-based Math and Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credit Hours</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

### Pre-Professional Requirements

Pre-professional courses are generally completed in the freshman and sophomore year.

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<tr>
<td></td>
<td><strong>Total Credit Hours</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

### Pre-Professional Requirements

The minimum number of semester hours required to graduate is 128.

7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

8. Students must meet Dearborn Discovery Core requirements. See [http://umdearborn.edu/696973/](http://umdearborn.edu/696973/) for details.

### Science Studies

We’re helping future generations develop a passion and appreciation for science.

Do you have an innate curiosity about the natural world? Would you like to share that passion with young learners through hands-on experiments? This bachelor’s degree program in Integrated Science Studies prepares you for leading diverse classrooms in their study of science’s fundamental concepts and disciplines.

Pair your studies with elementary teacher certification and you’ll be qualified to teach all subjects in grades K-5; or choose to become certified to teach science in grades 6-8. Either way, you’ll be part of a balanced program that combines academic studies, professional training, multiple field experiences in local schools, and thorough training in how to use technology in the 21st-century classroom.

And with successful completion of the program, you’ll earn both a bachelor’s degree and faculty recommendation for the Michigan Elementary Standard Certificate.

### Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

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Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

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Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

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- Additional Science Course

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Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Core Course Requirements**

Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.

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<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

**Pre-Professional Requirements**

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<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Devel</td>
<td>3</td>
</tr>
</tbody>
</table>

Required for Early Childhood and Special Education Majors only

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDF 450</td>
<td>Hlth, Nutr, &amp; PE/Clsrm Tchers</td>
<td>2</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 250</td>
<td>Elem Ed Vis &amp; Perf Arts</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 407</td>
<td>Inquiry-based Math and Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 21

1 Two of the three NSCI core courses may be transferred to UM-Dearborn. A) an introductory physical science will satisfy NSCI 231, B) an introductory earth/planetary science will satisfy NSCI 232, and C) an introductory life science course will satisfy NSCI 233. BIOL 240 (http://catalog.umd.umich.edu/archives/2019-2020/search/?P=BIOL%20240)/BIOL 242 (http://catalog.umd.umich.edu/archives/2019-2020/search/?P=BIOL%20242) and NSCI 120 (http://catalog.umd.umich.edu/archives/2019-2020/search/?P=NSCI%20120)/NSCI 121 (http://catalog.umd.umich.edu/archives/2019-2020/search/?P=NSCI%20121) cannot be used for science credit.

**Major Requirements**

A minimum of 36 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPS 220</td>
<td>Science in the Elem School</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 231</td>
<td>Inquiry: Physical Science (see Note #3 below)</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 232</td>
<td>Inquiry:Earth/Planet Science (see Note #3 below)</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 233</td>
<td>Inquiry: Life Science (see Note #3 below)</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 331</td>
<td>Phy. Sci. &amp; Everyday Thinking</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 332</td>
<td>Inquiry: Mich Earth Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 333</td>
<td>Inquiry: PBL in Life Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 42
Secondary Teacher Certification Program

Secondary Teacher Certification Program

UM-Dearborn students may earn a bachelor’s degree while securing a recommendation for a Secondary Standard Teaching Certificate. Programs are intended for those who wish to teach in either a middle school or senior high school. Students in this program will have two advisors, one in the College of Arts, Sciences, and Letters (CASL) to help plan the degree program and another, in the College of Education, Health, and Human Services, to assist in planning the teacher certification program.

Note: Education courses, or courses in the major or minor, may not be elected for pass/fail credit.

Certification

In recommending students for teacher's certificates, the College of Education, Health, and Human Services functions, indirectly, as an arm of the Michigan Department of Education. All such certificates awarded to students at the UM-Dearborn are issued at the request of an appropriate faculty body by the Michigan Department of Education in Lansing irrespective of the particular campus attended (Ann Arbor, Dearborn, Flint).

Campus Degree/Certification Program

Students, upon the successful completion of certification requirements, will receive their certification recommendation through the College of Education, Health, and Human Services and their degree recommendation from CASL. Therefore, they should be properly enrolled in the College of Education, Health, and Human Services and CASL. Students are responsible for meeting all of the appropriate degree requirements legislated by the particular unit that is to recommend their degree. The College of Education, Health, and Human Services and its faculty, therefore, can accept no responsibility for seeing that students are properly acquainted with their various degree requirements. Instead, students are to seek such information from the advisors available in their own particular degree recommending unit.

Certification Advising

All secondary certification students are assigned an academic advisor in the College of Education, Health, and Human Services. It is the policy of the College of Education, Health, and Human Services that all undergraduates and others seeking to earn the Standard Teaching Certificate are to meet with their certification academic advisor at least once per academic year. By means of this practice, the individual secondary certification student can be kept abreast of periodic modifications in the curriculum and in certification regulations.

Certification Requirements

A person desiring to earn a secondary standard teaching certificate must meet all of the conditions listed below.

1. The satisfactory completion of a degree program with an overall GPA of 2.75 or higher.
2. The satisfactory completion of a teaching major and a teaching minor, each with a GPA of 2.75 or higher.
3. The successful completion of EDA 205 Introduction to Education and EDT 211 Designing Tech-Based Learning Solutions is required of everyone desiring to qualify for a secondary teacher certification recommendation.
4. All requirements as identified in the College’s Four-Phase Checklist must be met for a teaching certificate recommendation.

The teaching certificate awarded to the beginning secondary school teacher is the Michigan Secondary Standard Teaching Certificate. This certificate is valid for teaching in grades six through twelve in those areas where the applicant has completed a major or minor, and passed

<table>
<thead>
<tr>
<th>Physical Science</th>
<th>3-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth/Planetary Science</td>
<td>3-4</td>
</tr>
<tr>
<td>Life Science</td>
<td>3-4</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>33-36</td>
</tr>
</tbody>
</table>

1 BIOL 240/BIOL 242 and NSCI 120/NSCI 121 cannot be used for science credit.

Major Notes:

1. 15 semester hours required at UM-Dearborn.
2. 6 semester hours required in courses at the 300 level or above.
3. Transfer students - 2 natural science courses may be transferred to UM-Dearborn: 
   a) an introductory physical science will satisfy NSCI 231; 
   b) an introductory earth/planetary science will satisfy NSCI 232; 
   c) an introductory life science course will satisfy NSCI 233.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. For admission to Phase III of the teacher certification program, passing scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score of 480) and in Mathematics (passing score 530) are required. The SAT must have been passed on or after March 5, 2016.
5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
6. Courses taken on a PASS/FFAIL basis will NOT be accepted toward program completion.
7. The minimum number of semester hours required to graduate is 128.
8. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
9. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details
the appropriate state mandated tests. It is valid for five years and may be renewed an unlimited number of times provided that renewal conditions are met. Legislative or other state action may change these specifications. Therefore, students are advised to contact the Office of Student Success in the College of Education, Health, and Human Services to learn of the most recent policies.

College of Education, Health, and Human Services Four-Phase Checklist

The College of Education, Health, and Human Services (CEHHS) at the UM-Dearborn is committed to the ideal of quality in the field of teacher education. A screening procedure is employed to help identify those people most likely to achieve the level of excellence defined by the college. This screening procedure is divided into four successive phases.

Requirements at one phase must be successfully completed before continuing on to the next. Students are also responsible for meeting all program requirements for their selected degree as listed in Degree Works.

Phase One - Initial Admission to Education

All requirements listed below must be completed for progression to Phase Two:

1. Three types of students are considered for admission to the College of Education, Health, and Human Services at this entry level phase:
   - First time in any college (FTIAC) students - Campus admission standards for SAT, ACT, and high school Grade Point Average (GPA) are used in determining admission.
   - Transfer students - Campus admission standards are used for students transferring 54 or fewer semester hours. College of Education, Health, and Human Services admission standards (a minimum cumulative GPA of 2.75/4.0 scale) are used for students transferring 55 or more semester hours.
   - Degreed persons seeking certification only - College of Education, Health, and Human Services admission standards are used for individuals with a bachelor’s degree earned at a regionally accredited institution. The individual must have a cumulative GPA of 2.75 or higher in their major, optional minor, and overall to be admitted to the College of Education, Health, and Human Services and the Teacher Certification Program.

2. A Criminal Background Check Consent form must be submitted online to the CEHHS Office of Student Success within the first semester enrolled.

3. Proof of valid TB (tuberculosis) clearance must be submitted online to the CEHHS Office of Student Success within the first semester enrolled.

4. Evidence of training for Infectious Diseases/Blood-borne Pathogens training must be completed in the Curriculum Knowledge Center (FCS 267) within the first semester enrolled.

5. Completion of the Campus Composition Placement Test within the first semester enrolled (not required for students admitted to the post-degree certification only program).

Phase Two - Preparation for Admission to the Teacher Certification Program

All requirements listed below must be completed for progression to Phase Three:

1. Successful completion of
   - COMP 105 (Writing & Rhetoric I), transfer credit equivalent, or waiver by Campus Composition Placement Text or university accepted high school Advanced Placement (AP) test score (not required for students admitted to the post-degree certification only program).
   - EDA 205 (Introduction to Education) or transfer credit equivalent.
   - EXPS 298 (Exploring Writing to Communicate, Learn and Teach).
   - COMP 227 (Interpretation & Argument) if prescribed by the results of the Campus Composition Placement Test (not required for students admitted to the post-degree certification only program).

2. Minimum of 55 earned credit hours, including transfer credit, or previously earned bachelor’s degree if applicable, with a minimum cumulative grade point average of 2.75.

3. Submission of completed Application for Admission to Teacher Certification Program (Phase III) form, which includes a moral turpitude statement, to the CEHHS Office of Student Success, 262 FCS.

4. Phase Three - Admission to Teacher Certification Program

Phase Three - Admission to Teacher Certification Program

All requirements listed below must be completed for progression to Phase Four:

1. Successful completion of the appropriate MTTC Certification Tests listed below and official score reporting directly to the University of Michigan-Dearborn (institution code 29):
   - Elementary certification students must pass the MTTC Elementary Education Test (#103)
   - Secondary certification students must pass the MTTC tests in their major.

2. Completion of at least one full semester (12 credit hours) of study at UM-Dearborn.

3. Completion of Professional Studies sequence of courses.

4. Minimum cumulative GPA of 2.75 on a 4.0 scale as well as a minimum GPA of 2.75 in the major(s) and the Professional Studies sequence.

5. Attendance at a Student Teaching Application and Placement Meeting and completion and submission of all forms online to the CEHHS Office of Student Success.

6. Verification with the Office of Student Success that all clearance requirements are valid and up-to-date prior to student teaching.
   - TB clearance
   - CPR and First Aid Certification (Adult/Infant/Child)
   - Evaluation of Oral Expression
   - Criminal background checks will be reviewed through ICHAT by the Office of Student Success each semester.

Phase Four - Teacher Certification Program Completion

All requirements listed below must be completed for recommendation for a degree and/or a State of Michigan Standard Teaching Certificate:

1. For undergraduate degree seeking students: Submission of completed Degree/Diploma application to the Enrollment Services Office. This application can be submitted online or printed and submitted in person, and can be found at https://umdearborn.edu/students/registration-records/graduation-commencement/applying-graduate-0 (https://umdearborn.edu/students/registration-records/graduation-commencement/applying-graduate-0/).
   - Elementary certification students apply to graduate as a student in the College of Education, Health, and Human Services.
• Secondary certification students apply to graduate as a student in the College of Arts, Sciences, and Letters.

2. **Post-degree certification only and undergraduate secondary certification program students** must submit a Program Completer Form online to the CEHHS Office of Student Success.

3. Successful completion of the chosen program, major(s) and professional studies sequence, including student teaching, and supplementary requirements with a minimum cumulative grade point average of 2.75 on a 4.0 scale, as well as minimum grade point average of 2.75 in the major(s) and professional studies sequence.

4. Successful completion of any additional MTTC certification tests and official score reporting directly to the University of Michigan-Dearborn (Institution Code 29) for any additional endorsements sought. These scores must be reported to the University of Michigan-Dearborn College of Education, Health, and Human Services before recommendations are prepared for the state by the University of Michigan-Dearborn Certification Officer:

   • Additional content area major(s) or minor(s), beyond the minimum requirement, for elementary certification students.

   • Additional content area major(s) or minor(s), beyond the minimum requirement, for secondary certification students.

Based on this record of achievement, a decision to recommend or not to recommend for certification will be made.

Secondary education students pursuing a bachelor's degree in the College of Arts, Sciences, and Letters should not confuse the requirements for their teaching major with those for their academic major in CASL. The courses required to complete a teaching major are determined by the College of Education, Health, and Human Services in compliance with the state certification code. The courses required for a degree major are prescribed by the CASL and are a part of the student's degree program. Often the two sets of requirements overlap so that by fulfilling concentration requirements, the student also, in most cases, completes most of the requirements for a teaching major. Occasionally, however, students must exercise caution when electing individual courses so that one set of requirements is not ignored while fulfilling the other. The student’s academic advisor in the College of Education, Health, and Human Services will be able to assist in planning an overall certification program that simultaneously meets both sets of requirements in an expeditious manner.

**Professional Requirements**

Preparation for a teaching credential consists of required courses in education. At least two practicums and methods courses in the academic major and minor are required prior to directed teaching.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 205</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>Professional Sequence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A minimum of 35 semester hours of coursework is required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDA 340</td>
<td>Foundations of American Ed</td>
<td>3</td>
</tr>
<tr>
<td>Multicultural education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPS 410</td>
<td>Multicult in School and Soc</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDC 300</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 302</td>
<td>Adol Devl &amp; Classroom Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>EDC 304</td>
<td>Pract Adol Devl&amp;Clsrm Mgmt</td>
<td>1</td>
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<tr>
<td>EDC 460</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
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<tr>
<td>Methodologies (See Note #1 below)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDD 469</td>
<td>Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>Methods Course in Selected Major/Minor and practicum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDD 440</td>
<td>Teach English in Second Grds &amp; EDD 441</td>
<td>4</td>
</tr>
<tr>
<td>&amp; EDD 450</td>
<td>Teach Math in Second Grades</td>
<td>4</td>
</tr>
<tr>
<td>&amp; EDD 451</td>
<td>and Practicum: Math Second School</td>
<td>4</td>
</tr>
<tr>
<td>EDD 480</td>
<td>Teach of Sci in the Second Grd &amp; EDD 481</td>
<td>4</td>
</tr>
<tr>
<td>&amp; EDD 490</td>
<td>Teach of the Soc Stud in Sec Sch</td>
<td>4</td>
</tr>
<tr>
<td>&amp; EDD 497</td>
<td>and Practicum in Soc Stud:Sec Sch</td>
<td>4</td>
</tr>
<tr>
<td>EDD 496</td>
<td>Second Lang Tchg: Sec Level</td>
<td>2-3</td>
</tr>
<tr>
<td>&amp; EDD 497</td>
<td>and Second Lang Tchg: Sec Level</td>
<td>4</td>
</tr>
<tr>
<td>Select from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methods course in minor if different than major Education elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDD 421</td>
<td>Directed Teach Secondary Sch</td>
<td>12</td>
</tr>
<tr>
<td>EDD 424</td>
<td>Sem: Teaching Secondary Grds</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes:**

1. Enrollment in all the required EDD courses is open only to those who are officially admitted to and in good academic standing in the Teacher Certification Program at UM-Dearborn. See Four-Phase Checklist for more information.

2. Eligibility for directed teaching requires meeting all the requirements listed on the Four-Phase Checklist as well as submission of passing scores from the MTTC (Michigan Tests for Teacher Certification) subject area tests in the student’s major and minor.

3. Recommendations for other certification endorsements require passing scores from relevant MTTC subject area tests.

The program as outlined above meets the Michigan Department of Education teacher certification requirements at the time of this writing. However, changes by the University or the Michigan Department of Education may affect some program requirements. Therefore, students are strongly advised to inquire about possible changes by checking with the College of Education, Health, and Human Services Office of Student Success and/or with their academic advisor.

**Areas of Study for Majors and Minors**

The teaching majors and minors currently available for secondary certification students are listed below:

- Biology (p. 579)
- Chemistry (p. 580)
- Earth Science (p. 581)
- Economics (p. 582)
- English (p. 583)
- English as a Second Language (p. 584)
- French (p. 584)
- Geography (p. 585)
Secondary Certification Teaching Major/Minor Biology

Major Requirements
A minimum of 32 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 130 &amp; 130L</td>
<td>Intro Org and Environ Biology and Intro Org &amp; Envir Biol Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 140 &amp; 140L</td>
<td>Intro Molec &amp; Cellular Biology and Intr Molec &amp; Cell Biol Lab/Rec</td>
<td>4</td>
</tr>
</tbody>
</table>

Cellular and Molecular Biology:
Select two courses from below. One must be a laboratory course: 6-8

| BIOL 301 & 301L | Cell Biology and Cell Biology Lab           |              |
| BIOL 306 & BIOL 307 | General Genetics and General Genetics Laboratory |              |
| BIOL 370        | Principles of Biochemistry                  |              |
| BIOL 380        | Epidemiology                                |              |

| BIOL 385 & 385L | Microbiology and Microbiology Lab            |              |
| BIOL 405 & 405L | Applied & Environ Microbiology and Appl & Envir Microbiology Lab |              |
| BIOL 406        | Microbial Genetics                           |              |
| BIOL 450        | Virology                                     |              |
| BIOL 455        | Immunology                                    |              |
| BIOL 470 & BIOL 472 | Biochemistry I and Biochemistry Lab I     |              |
| BIOL 471 & BIOL 473 | Biochemistry II and Biochemistry Laboratory II |              |
| BIOL 474 & 474L | Molecular Biology and Molecular Biology Lab |              |
| BIOL 485        | Physiology of Micro-organisms                |              |

Areas of Study for Minor (Optional)

- Biology (p. 580)
- Chemistry (p. 581)
- Earth Science (p. 582)
- Economics (p. 583)
- English (p. 583)
- English as a Second Language (p. 584)
- French (p. 585)
- Geography (p. 585)
- German (p. 585)
- History (p. 587)
- Integrated Science (p. 587)
- Mathematics (p. 589)
- Physics (p. 590)
- Political Science (p. 591)
- Psychology (p. 591)
- Spanish (p. 592)
- Speech (p. 594)

Electives
Select 0-4 credit hours from above: 0-4

Total Credit Hours 28-37

One course in genetics: either BIOL 306 or BIOL 360, must be selected.

Major Notes:
1. A minimum GPA of 2.75 is required for a major.
2. For the major, 16 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.
4. Additional courses may be required to satisfy program and 32 semester hour requirement.
Secondary Certification Teaching Major/Minor Chemistry

Major Requirements
A minimum of 33 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 134 &amp; 134L</td>
<td>General Chemistry IA and General Chemistry IA Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 144 &amp; 144L</td>
<td>General Chemistry IB and General Chem IB Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 136 &amp; 136L</td>
<td>General Chemistry IIA and General Chem IIA Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 146 &amp; 146L</td>
<td>General Chemistry IIB and General Chem IIB Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 227</td>
<td>Organic Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 303</td>
<td>Inorganic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 344 &amp; 344L</td>
<td>Quantitative Analysis and Quantitative Analysis Lab</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 368</td>
<td>Physical Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 348</td>
<td>Environmental Chemistry</td>
<td>3-4</td>
</tr>
<tr>
<td>CHEM 403</td>
<td>Inorganic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 447</td>
<td>Instrumental Methods of Analys</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 469</td>
<td>Physical Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 470</td>
<td>Biochemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 348</td>
<td>Environmental Chemistry</td>
<td>3-4</td>
</tr>
<tr>
<td>CHEM 403</td>
<td>Inorganic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 447</td>
<td>Instrumental Methods of Analys</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 469</td>
<td>Physical Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 470</td>
<td>Biochemistry I</td>
<td>3</td>
</tr>
</tbody>
</table>

Advanced Chemistry Course
Select at least one from the following:

- CHEM 348 Environmental Chemistry
- CHEM 403 Inorganic Chemistry II
- CHEM 447 Instrumental Methods of Analys
- CHEM 469 Physical Chemistry II
- CHEM 470 Biochemistry I

Additional Chemistry Lab Courses
Select one from the following:

- CHEM 450 Adv Org Syn & Character Lab
- CHEM 452 Adv Inorg Synth & Char Lab
- CHEM 481 Physicochemical Measurements

Total Credit Hours 30-32

Chemistry/Instructional Track
The Chemistry/Instructional Track concentration is an interdisciplinary program leading to a BS degree in Chemistry, and to a Michigan Provisional Secondary Teaching Certificate. It is a collaboration between the Department of Natural Sciences and the College of Education, Health, and Human Services. For further information, contact advisors in the Dept. of Natural Sciences at 313-593-5627.

Major Notes:

1. A minimum GPA of 2.75 is required for a major.
2. For the major, 16 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for the major.
Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Minor Requirements

A minimum of 22 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 134 &amp; 134L</td>
<td>General Chemistry IA and General Chemistry IA Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 144 &amp; 144L</td>
<td>Gen Chemistry IB and General Chem IB Lab/Rec</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 136 &amp; 136L</td>
<td>General Chemistry IIA and General Chem IIA Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 146 &amp; 146L</td>
<td>General Chemistry IIB and General Chem IIB Lab/Rec</td>
<td></td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 303</td>
<td>Inorganic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 344 &amp; 344L</td>
<td>Quantitative Analysis and Quantitative Analysis Lab</td>
<td>4</td>
</tr>
</tbody>
</table>

Secondary Certification Teaching Major/Minor Earth Science

Major Requirements

A minimum of 32 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 203</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 118 &amp; 118L</td>
<td>Physical Geology and Physical Geology Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 218 &amp; 218L</td>
<td>Historical Geology and Historical Geology Lab</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 340</td>
<td>Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 342</td>
<td>Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
<td>1</td>
</tr>
<tr>
<td>ASTR 130</td>
<td>Introduction to Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 131</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Electives

Select from the following

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESCI 330</td>
<td>Land Use Planning and Mgmt</td>
<td></td>
</tr>
<tr>
<td>GEOL 332</td>
<td>Hazardous Waste Management</td>
<td></td>
</tr>
<tr>
<td>GEOL 370</td>
<td>Environmental Geology</td>
<td></td>
</tr>
<tr>
<td>GEOL 372</td>
<td>Energy Resources</td>
<td></td>
</tr>
<tr>
<td>GEOL 375</td>
<td>Groundwater Hydrology</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 32

Major Notes:

1. A minimum GPA of 2.75 is required for a major.
2. At least 15 semester hours of courses at UM-Dearborn required for a major.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College
of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.

5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.

8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Minor Requirements
A minimum of 25 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG 203</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 118 &amp; 118L</td>
<td>Physical Geology and Physical Geology Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 218 &amp; 218L</td>
<td>Historical Geology and Historical Geology Lab</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 342</td>
<td>Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
<td>1</td>
</tr>
<tr>
<td>ASTR 130</td>
<td>Introduction to Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 131</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
<tr>
<td>EDD 481</td>
<td>Practicum in Science:Secnd Grd</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select from the following:</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>ESCI 330</td>
<td>Land Use Planning and Mgmt</td>
<td></td>
</tr>
<tr>
<td>GEOL 332</td>
<td>Hazardous Waste Management</td>
<td></td>
</tr>
<tr>
<td>GEOL 340</td>
<td>Remote Sensing</td>
<td></td>
</tr>
<tr>
<td>GEOL 370</td>
<td>Environmental Geology</td>
<td></td>
</tr>
<tr>
<td>GEOL 372</td>
<td>Energy Resources</td>
<td></td>
</tr>
<tr>
<td>GEOL 375 &amp; 375L</td>
<td>Groundwater Hydrology and Groundwater Hydrology Lab</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Credit Hours 25

Minor Notes:
1. A minimum GPA of 2.75 is required for a major.
2. For the major, 15 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.

Major Requirements
A minimum of 30 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 301</td>
<td>Intermediate Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 302</td>
<td>Intermediate Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 351</td>
<td>Environmental Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 361</td>
<td>U S Economic History</td>
<td>3</td>
</tr>
<tr>
<td>ECON 448</td>
<td>International Trade</td>
<td>3</td>
</tr>
</tbody>
</table>

The balance of courses to be selected with the approval of the advisor in accordance with the Economic concentration and certification requirements.

Total Credit Hours 30

Major Notes:
1. A minimum GPA of 2.75 is required for a major.
2. For the major, 15 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.

Program Notes:
1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of
Minor Requirements
A minimum of 22 semester hours is required.

Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 301</td>
<td>Intermediate Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 302</td>
<td>Intermediate Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 351</td>
<td>Environmental Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 361</td>
<td>U.S. Economic History</td>
<td>3</td>
</tr>
<tr>
<td>ECON 448</td>
<td>International Trade</td>
<td>3</td>
</tr>
<tr>
<td>EDD 489</td>
<td>Practicum in Soc Stud:Sec Sch</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credit Hours</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

Minor Notes:
1. A minimum GPA of 2.75 is required for a minor.
2. For the minor, 9 semester hours must be in courses numbered 300 or above.

Secondary Certification Teaching
Major/Minor English

Major Requirements
A minimum of 30 semester hours is required.

Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 323</td>
<td>Advanced Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 327</td>
<td>Advanced Exposition</td>
<td></td>
</tr>
<tr>
<td>ENGL/LING 461</td>
<td>Modern English Grammar</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 482</td>
<td>History of the English Lang</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL/LING 383</td>
<td>American English</td>
<td></td>
</tr>
<tr>
<td>LING 425</td>
<td>Language and Society</td>
<td></td>
</tr>
<tr>
<td>ENGL/LING 461</td>
<td>Modern English Grammar</td>
<td>3</td>
</tr>
<tr>
<td>ENGL/LING 464</td>
<td>Contemporary Rhetorical Theory</td>
<td></td>
</tr>
<tr>
<td>ENGL/LING 465</td>
<td>Discourse Analysis</td>
<td></td>
</tr>
<tr>
<td>LING 476</td>
<td>Sociolinguistics</td>
<td></td>
</tr>
<tr>
<td>ENGL/LING 477</td>
<td>African American English</td>
<td></td>
</tr>
<tr>
<td>ENGL/LING 482</td>
<td>History of the English Lang</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL/LING 484</td>
<td>World Englishes</td>
<td>21</td>
</tr>
</tbody>
</table>

The balance of the courses are to be selected with the approval of the degree and certification advisors in accordance with the English concentration requirements. Among the electives JASS 310, JASS 330 and COMM 340 are allowed.

Supplementary requirement (not included in the 30 semester hours):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIBR 470</td>
<td>Literature for Young People</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 33

Major Notes:
1. A minimum GPA of 2.75 is required for a major.
2. For the major, 18 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.
4. COMP 105 and COMP 106 are required for undergraduate degree seekers, but cannot be counted toward the English major. LING 280 is a prerequisite for linguistics courses at 300 or above, ENGL 223 is a prerequisite for ENGL 323, and any 200 level English literature course is a prerequisite for most English literature courses at 300 or above.

Program Notes:
1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Minor Requirements
A minimum of 22 semester hours is required.
Secondary Certification Teaching Minor English as a Second Language

Minor Requirements

Students must demonstrate experience in learning a modern second language or coursework in a modern second language or permission of Program Coordinator, or take one course in a modern language.

A minimum of 21 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 447</td>
<td>Tchng English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract: Tchng Engl Secnd Lang</td>
<td>1</td>
</tr>
<tr>
<td>EDC 455</td>
<td>Assmt: Sec Lang Learning K-12</td>
<td>2</td>
</tr>
<tr>
<td>EDC 490</td>
<td>Litry Instr &amp; Assess for Els</td>
<td>3</td>
</tr>
<tr>
<td>LING 474</td>
<td>Second Lang Acquisition: Engl</td>
<td>3</td>
</tr>
<tr>
<td>LING 480</td>
<td>Concepts in Linguistics</td>
<td>3</td>
</tr>
</tbody>
</table>

*Required Courses*:

- ENGL 323 Advanced Creative Writing 3
- or ENGL 327 Advanced Exposition 3
- ENGL/LING 461 Modern English Grammar 3
- or ENGL 482 History of the English Lang 3
- EDD 441 Practicum: English Second Grd 1

Select one of the following: 3

- ENGL/LING 461 Modern English Grammar
- ENGL/LING 482 History of the English Lang
- LING 383 American English
- LING 425 Language and Society
- LING 464 Contemporary Rhetorical Theory
- LING 465 Discourse Analysis
- LING 476 Sociolinguistics
- LING 477 African American English
- LING 484 World Englishes

The balance of the courses are to be selected with the approval of the degree and certification advisors in accordance with the English concentration requirements. Among the electives JASS 310, JASS 330 and COMM 340 are allowed.

Supplementary requirement (not included in the 22 semester hours):

LIBR 470 Literature for Young People 3

Total Credit Hours: 25

*Minor Notes:*

1. *A minimum GPA of 2.75 is required for a minor.*
2. COMP 105 and COMP 106 are required but do not count toward the English minor.
3. *For the minor, 9 semester hours must be in courses numbered 300 or above.*

Secondary Certification Teaching Major/Minor French

Major Requirements

A minimum of 30 semester hours in coursework beyond second-year proficiency is required.

**Prerequisite:** FREN 202 or equivalent French language proficiency (not counted toward major).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 301</td>
<td>Advanced Conversation and Comp</td>
<td>3</td>
</tr>
<tr>
<td>FREN 302</td>
<td>Advanced Conversation and Comp</td>
<td>3</td>
</tr>
<tr>
<td>FREN 305</td>
<td>Language of Business</td>
<td>3</td>
</tr>
</tbody>
</table>

One specialized language course, such as:

- FREN 306 Cult Intro to French Business
- FREN 308 Advanced Writing
- FREN 408 Writing and Translating

Two civilization courses, such as:

- FREN 336 French Civilization of Past
- FREN 337 France in the 20th Century
- FREN 338 France of Today
- FREN 399 Francophone Lit and Civil
- FREN 388 Socio-Ctrl Iss Contemp France

One visual culture course, such as:

- FREN 332 French Cinema

One literature course, such as:

- FREN 330 French Lit: Md Ages-18 Century
- FREN 331 French Lit: 19th-20th Century
- FREN 334 Workshop in French Theater
- FREN 375 Parisian Itineraries

Additional credit hours from other French area offerings: 6

Total Credit Hours: 30

*Major Notes:*

1. A minimum GPA of 2.75 is required for a minor.
2. LING 480 is a prerequisite for LING 461/ENGL 461, LING 482/ENGL 482, LING 484, LING 474 and LING 476.
1. A minimum GPA of 2.75 is required for a major.
2. Majors are encouraged to strengthen their knowledge of French language and culture by participating in any of the approved study-abroad programs.
3. For the major, 30 credit hours must be in courses numbered 300 or above.
4. At least 15 credit hours in UM-Dearborn courses required for a major.

**Minor Requirements**

**A minimum of 22 semester hours is required.**

**Prerequisites:** FREN 202 or equivalent French language proficiency (not counted toward major).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 301</td>
<td>Advanced Conversation and Comp</td>
<td>3</td>
</tr>
<tr>
<td>FREN 302</td>
<td>Advanced Conversation and Comp</td>
<td>3</td>
</tr>
<tr>
<td>FREN 305</td>
<td>Language of Business</td>
<td>3</td>
</tr>
</tbody>
</table>

**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major; 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.

5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.

6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

7. Initial certification program students must have passing scores on the appropriate MTTT subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.

8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTT subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

9. Candidates must pass the Oral Proficiency Interview at the “Advanced-Low” level of proficiency, as required by the Michigan Department of Education.

**Minor Notes:**

1. A minimum GPA of 2.75 is required for a minor
2. Minors are encouraged to strengthen their knowledge of French language and culture by participating in any of the approved study-abroad programs.
3. For the minor, 20 credit hours must be in courses numbered 300 or above.
4. Candidates must pass the Oral Proficiency Interview at the “Advanced-Low” level of proficiency, as required by the Michigan Department of Education.

**Secondary Certification Teaching Minor Geography**

**Minor Requirements**

A minimum of 22 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 201</td>
<td>Cultural Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 205</td>
<td>Geography of the United States</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 206</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 300</td>
<td>Urban Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 310</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>POL 101</td>
<td>American Politics</td>
<td>3</td>
</tr>
<tr>
<td>EDD 489</td>
<td>Practicum in Soc Stud:Sec Sch</td>
<td>1</td>
</tr>
</tbody>
</table>

Select one of the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 302</td>
<td>Mapping Our World</td>
<td></td>
</tr>
<tr>
<td>GEOG 305</td>
<td>Intro to GIS</td>
<td></td>
</tr>
</tbody>
</table>

**Supplementary Requirements:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
<td></td>
</tr>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td></td>
</tr>
<tr>
<td>HIST 111</td>
<td>The American Past I</td>
<td></td>
</tr>
</tbody>
</table>
Secondary Certification Teaching
Minor German

Minor Requirements
A minimum of 21-22 semester hours is required beyond second-year proficiency.

Prerequisites: GER 202 or equivalent German language proficiency. (Hours not counted in the 20 semester hour requirement.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER 301</td>
<td>Advancing Competencies I</td>
<td>3</td>
</tr>
<tr>
<td>GER 302</td>
<td>Advancing Competencies II</td>
<td>3</td>
</tr>
<tr>
<td>GER 305</td>
<td>German for the Professions</td>
<td>3</td>
</tr>
<tr>
<td>EDD 497</td>
<td>Second Lang Tchg: Sec Level</td>
<td>1</td>
</tr>
<tr>
<td>One cultural/civilization course, such as:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GER 306</td>
<td>Cross-Cult Comptncy&amp;Professns</td>
<td></td>
</tr>
<tr>
<td>GER 376</td>
<td>Contemporary German Cultures</td>
<td></td>
</tr>
<tr>
<td>GER 377</td>
<td>German Culture &amp; Civilization</td>
<td></td>
</tr>
<tr>
<td>One literature course, such as:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GER 371</td>
<td>Germ Lit: Classic and Romantic</td>
<td></td>
</tr>
<tr>
<td>GER 372</td>
<td>Introduction to German Lit</td>
<td></td>
</tr>
<tr>
<td>One visual culture course, such as:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GER 374</td>
<td>The History of German Cinema</td>
<td></td>
</tr>
<tr>
<td>Elective credit hours from German area offerings:</td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>21-22</td>
</tr>
</tbody>
</table>

Notes:
1. A minimum GPA of 2.75 is required for a minor.
2. 20 credit hours must be in courses numbered 300 or above.
3. Minors are encouraged to strengthen their knowledge of German language and culture by participating in any of the approved study-abroad programs.
4. Candidates must pass the Oral Proficiency Interview at the “Advanced-Low” level of proficiency, as required by the Michigan Department of Education.

Secondary Certification Teaching
Major/Minor History

Major Requirements
A minimum of 30 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 111</td>
<td>The American Past I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 112</td>
<td>The American Past II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 300</td>
<td>The Study of History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 361</td>
<td>United States Economic History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3601</td>
<td>Michigan History</td>
<td>3</td>
</tr>
<tr>
<td>Balance of courses to be selected from three different global areas:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia, Europe, Africa, the Americas, Russia or the Middle East</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Major Notes:
1. A minimum GPA of 2.75 is required for a major.
2. For the major, 15 semester hours must be in courses numbered 300 or above.
3. 15 semester hours in UM-Dearborn courses required for a major. 9 semester hours in UM-Dearborn courses required for a minor.

Program Notes:
1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.
Minor Requirements
A minimum of 22 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>HIST 111</td>
<td>The American Past I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 112</td>
<td>The American Past II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 300</td>
<td>The Study of History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 361</td>
<td>United States Economic History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3601</td>
<td>Michigan History</td>
<td>3</td>
</tr>
<tr>
<td>EDD 489</td>
<td>Practicum in Soc Stud:Sec Sch</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 22

Minor Notes:
1. A minimum GPA of 2.75 is required for a minor.
2. For the minor, 9 semester hours must be in courses numbered 300 or above.
3. 9 semester hours in UM-Dearborn courses required for a minor.

Secondary Certification Teaching Major/Minor Integrated Science

Major Requirements
A minimum of 36 semester hours is required spread over three of the four subject areas for Integrated Science. The remaining subject area will constitute your minor. You must minor in one of these four disciplines.

Biology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130 &amp; 130L</td>
<td>Intro Org and Environ Biology and Intro Org &amp; Envr Biol Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 140 &amp; 140L</td>
<td>Intro Molec &amp; Cellular Biology and Intr Molec &amp; Cell Biol Lab/Rec</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 301 &amp; 301L</td>
<td>Cell Biology and Cell Biology Lab</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 304 &amp; 304L</td>
<td>Ecology and Ecology Lab</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 306</td>
<td>General Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 320</td>
<td>Field Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 360</td>
<td>Population Genetics &amp; Evolutn</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 385 &amp; 385L</td>
<td>Microbiology and Microbiology Lab</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Credit Hours 12

Chemistry

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 134 &amp; 134L</td>
<td>General Chemistry IA and General Chemistry IA Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 136 &amp; 136L</td>
<td>General Chemistry IIA and General Chem IIA Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 146 &amp; 146L</td>
<td>General Chemistry IIB and General Chem IIB Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 227</td>
<td>Organic Chemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 303</td>
<td>Inorganic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 344 &amp; 344L</td>
<td>Quantitative Analysis and Quantitative Analysis Lab</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 10-11

Earth Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 118 &amp; 118L</td>
<td>Physical Geology and Physical Geology Lab/Rec</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 203</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 130</td>
<td>Introduction to Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 131</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 218 &amp; 218L</td>
<td>Historical Geology and Historical Geology Lab</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 332</td>
<td>Hazardous Waste Management</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 340</td>
<td>Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 342</td>
<td>Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 370</td>
<td>Environmental Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 377</td>
<td>Field Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 12-15

Physics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 125 &amp; 125L</td>
<td>Introductory Physics I and Introductory Physics I Lab/Dis</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 150 &amp; 150L</td>
<td>General Physics I and General Physics I Lab/Dis</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 126 &amp; 126L</td>
<td>Introductory Physics II and Intro Physics II Lab/Dis</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 151 &amp; 151L</td>
<td>General Physics II and General Physics II Lab/Dis</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 305</td>
<td>Contemporary Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 360</td>
<td>Instrumentation for Scientists</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 401</td>
<td>Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 403</td>
<td>Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 405</td>
<td>Optics</td>
<td>4</td>
</tr>
</tbody>
</table>
A minimum of 30 semester hours is required.

**Major Requirements**

1. A minimum GPA of 2.75 is required for a major.
2. At least 15 hours of UM-Dearborn courses are required for a major.

**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

**Minor Requirements**

A minimum of 20 additional hours is required in one of the subject areas: Biology, Chemistry, Earth Science, Physics. See information under Major Integrated Science.

**Additional Notes:**

1. An overall GPA of 2.75 or better is required for a major.
2. At least 15 hours of UM-Dearborn courses are required for a major.

**Secondary Certification Teaching Major Learning Disabilities**

**Major Requirements**

A minimum of 30 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 401</td>
<td>Introduction to LD</td>
<td>3</td>
</tr>
<tr>
<td>EDN 401</td>
<td>Strategies for LD</td>
<td>3</td>
</tr>
<tr>
<td>EDN 403</td>
<td>Assessment of the Learner</td>
<td>3</td>
</tr>
<tr>
<td>EDN 404</td>
<td>Assessment Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDN 402</td>
<td>Socio-vocational Transitions</td>
<td>3</td>
</tr>
<tr>
<td>PDED 405</td>
<td>Sp Ed Legisln and Litigation</td>
<td>3</td>
</tr>
<tr>
<td>EDC 417</td>
<td>Mgmt of Classroom Behavior</td>
<td>3</td>
</tr>
<tr>
<td>EDT 430</td>
<td>Assistive Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDD 413</td>
<td>LD Elem Directed Teaching</td>
<td>2</td>
</tr>
<tr>
<td>EDD 420</td>
<td>LD Sec Directed Teaching</td>
<td>2</td>
</tr>
<tr>
<td>EDN 408</td>
<td>LD Directed Teaching Seminar</td>
<td>2</td>
</tr>
</tbody>
</table>

**Supplementary Requirement (not included in the 30 semester hours)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
</tbody>
</table>

**Major Notes:**

1. A minimum GPA of 2.75 is required for a major.
2. Initial certification students who select Learning Disabilities must also select an additional content major from the following: Biology, Chemistry, Earth Science, Economics, English, French, History, Mathematics, Physics, Political Science, Social Studies, or Spanish.

**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. For admission to Phase III of the teacher certification program, passing scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score of 480) and in Mathematics (passing score 530) are required. The SAT must have been passed on or after March 5, 2016.
5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
6. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
8. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
9. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Secondary Certification Teaching Major/Minor Mathematics

Major Requirements

A minimum of 30 semester hours from courses numbered above MATH 105 is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 216</td>
<td>Intro to Diff Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 300</td>
<td>Math Lang Proof &amp; Struct</td>
<td>3</td>
</tr>
<tr>
<td>MATH 331</td>
<td>Survey of Geometry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 412</td>
<td>First Course in Modern Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 486</td>
<td>Sec School Math for Teachers</td>
<td>3</td>
</tr>
</tbody>
</table>

Recommended electives:

- MATH 276: Discrete Math Meth Comptr Engr
- MATH 315: Applied Combinatorics
- MATH 372: Computing with Mathematica
- MATH 395: Elementary Number Theory
- MATH 413: Linear Algebra
- MATH 444: Data Anlsys,Prob&Stat forTchrs
- MATH 455: Func of a Complex Var with App
- MATH 462: Mathematical Modeling
- MATH 480: History of Mathematics

Supplementary requirements (not included in the 30 hours):

- CIS 150: Computer Science I
- or CCM 172: Computing Environ for Math
- STAT 325: Applied Statistics I

Total Credit Hours 33

Major Notes:

1. A minimum GPA of 2.75 is required for a major.
2. For the major, 12 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.

2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Minor Requirements

A minimum of 21 semester hours from courses numbered above MATH 105 is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 300</td>
<td>Math Lang Proof &amp; Struct</td>
<td>3</td>
</tr>
<tr>
<td>MATH 331</td>
<td>Survey of Geometry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 486</td>
<td>Sec School Math for Teachers</td>
<td>3</td>
</tr>
<tr>
<td>EDD 451</td>
<td>Practicum: Math Second School</td>
<td>1</td>
</tr>
</tbody>
</table>

Recommended electives, if needed:

- MATH 215: Calculus III
- MATH 276: Discrete Math Meth Comptr Engr
- MATH 315: Applied Combinatorics
- MATH 372: Computing with Mathematica
- MATH 395: Elementary Number Theory
- MATH 412: First Course in Modern Algebra
- MATH 444: Data Anlsys,Prob&Stat forTchrs
- MATH 455: Func of a Complex Var with App
- MATH 462: Mathematical Modeling
- MATH 480: History of Mathematics
- STAT 325: Applied Statistics I (or a course in data analysis and probability)
Secondary Certification Teaching Major/Minor Physics

Major Requirements

A minimum of 32 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td>General Physics I Lab/Dis</td>
<td></td>
</tr>
<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 151L</td>
<td>General Physics II Lab/Dis</td>
<td></td>
</tr>
<tr>
<td>PHYS 305</td>
<td>Contemporary Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 401</td>
<td>Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 403</td>
<td>Electricity and Magnetism</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

Select from the following: 15

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 320</td>
<td>Environmental Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 360</td>
<td>Instrumentation for Scientists</td>
<td></td>
</tr>
<tr>
<td>PHYS 405</td>
<td>Optics</td>
<td></td>
</tr>
<tr>
<td>PHYS 406</td>
<td>Thermal and Statistical Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 453</td>
<td>Quantum Mechanics</td>
<td></td>
</tr>
<tr>
<td>PHYS 457</td>
<td>Atomic and Nuclear Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 460</td>
<td>Advanced Physics Laboratory</td>
<td></td>
</tr>
<tr>
<td>PHYS 463</td>
<td>Solid State Physics</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 32

Major Notes:

1. A minimum GPA of 2.75 is required for a major.
2. For the major, 18 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.

Minor Requirements

A minimum of 21 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 125L</td>
<td>Introductory Physics I Lab/Dis</td>
<td></td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td>General Physics I Lab/Dis</td>
<td></td>
</tr>
<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 151L</td>
<td>General Physics II Lab/Dis</td>
<td></td>
</tr>
<tr>
<td>PHYS 305</td>
<td>Contemporary Physics</td>
<td>3</td>
</tr>
<tr>
<td>EDD 481</td>
<td>Practicum in Science:Secnd Grd</td>
<td>1</td>
</tr>
</tbody>
</table>

Additional hours selected from the following: 9

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 320</td>
<td>Environmental Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 360</td>
<td>Instrumentation for Scientists</td>
<td></td>
</tr>
<tr>
<td>PHYS 401</td>
<td>Mechanics</td>
<td></td>
</tr>
<tr>
<td>PHYS 403</td>
<td>Electricity and Magnetism</td>
<td></td>
</tr>
<tr>
<td>PHYS 405</td>
<td>Optics</td>
<td></td>
</tr>
<tr>
<td>PHYS 453</td>
<td>Quantum Mechanics</td>
<td></td>
</tr>
<tr>
<td>PHYS 457</td>
<td>Atomic and Nuclear Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 460</td>
<td>Advanced Physics Laboratory</td>
<td></td>
</tr>
<tr>
<td>PHYS 463</td>
<td>Solid State Physics</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 21

Notes:

1. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
2. Courses taken on a PASS/FALL basis will NOT be accepted toward program completion.
3. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
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5. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. For the minor, 6 semester hours must be in courses numbered 300 or above.
1. A minimum GPA of 2.75 is required for a minor.
2. For the minor, 9 semester hours must be in courses numbered 300 or above.

Secondary Certification Teaching Major/Minor Political Science

Major Requirements

A minimum of 30 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>POL 101</td>
<td>American Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 201</td>
<td>Politics Around the World</td>
<td>3</td>
</tr>
<tr>
<td>POL 313</td>
<td>American State Government</td>
<td>3</td>
</tr>
<tr>
<td>POL 316</td>
<td>The American Judicial Process</td>
<td>3</td>
</tr>
<tr>
<td>POL 325</td>
<td>Environmental Politics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>POL 371</td>
<td>Problems in Intl Politics</td>
</tr>
<tr>
<td></td>
<td>or POL 471</td>
<td>American Foreign Policy I</td>
</tr>
<tr>
<td></td>
<td>or POL 472</td>
<td>American Foreign Policy II</td>
</tr>
</tbody>
</table>

The balance of courses to be selected with the approval of the academic advisor in accordance with the Political Science concentration and certification requirements.

Total Credit Hours

30

Major Notes:

1. A minimum GPA of 2.75 is required for a major.
2. For the major, 18 semester hours must be in courses numbered 300 or above.
3. At least 15 semester hours in UM-Dearborn courses required for a major.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.

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Minor Requirements

A minimum of 22 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>POL 101</td>
<td>American Politics</td>
<td>3</td>
</tr>
<tr>
<td>POL 201</td>
<td>Politics Around the World</td>
<td>3</td>
</tr>
<tr>
<td>POL 313</td>
<td>American State Government</td>
<td>3</td>
</tr>
<tr>
<td>POL 316</td>
<td>The American Judicial Process</td>
<td>3</td>
</tr>
<tr>
<td>POL 325</td>
<td>Environmental Politics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>POL 371</td>
<td>Problems in Intl Politics</td>
</tr>
<tr>
<td></td>
<td>or POL 471</td>
<td>American Foreign Policy I</td>
</tr>
<tr>
<td></td>
<td>or POL 472</td>
<td>American Foreign Policy II</td>
</tr>
</tbody>
</table>

Total Credit Hours

22

Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. For the minor, 9 semester hours must be in courses numbered 300 or above.
3. 9 semester hours in UM-Dearborn courses required for a minor.

Secondary Certification Teaching Minor Psychology

Minor Requirements

A minimum of 22 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 300</td>
<td>Life-Span Developmental Psych</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 320</td>
<td>Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDC 304</td>
<td>Pract Adol Devl&amp;Clsrm Mgmt</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSYC 315</td>
<td>Personality Development</td>
</tr>
<tr>
<td></td>
<td>or PSYC 4445</td>
<td>Personality Assessment Lab</td>
</tr>
<tr>
<td></td>
<td>or PSYC 450</td>
<td>Personality Theory</td>
</tr>
</tbody>
</table>
Select three of the following:  
- PSYC 321 Attitude and Social Behavior  
- PSYC 322 Psychology of Prejudice  
- PSYC 363 Cognitive Psychology  
- PSYC 418 Cognitive Development  
- PSYC 421 Group Processes  
- PSYC 461 Learning and Memory  

Total Credit Hours: 22

Notes:  
1. A minimum GPA of 2.75 is required for a minor.  
2. 18 semester hours must be in courses numbered 300 or above.  
3. 9 semester hours in UM-Dearborn courses required for a minor.

Secondary Certification Teaching Major - Social Studies

Major Requirements

A minimum of 36 semester hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Geography</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG 206</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG (300-level) Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>History:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIST 101</td>
<td>The World to 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>HIST 103</td>
<td>The World Since 1500 CE</td>
<td>3</td>
</tr>
<tr>
<td>HIST 111</td>
<td>The American Past I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 112</td>
<td>The American Past II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 3601</td>
<td>Michigan History</td>
<td>3</td>
</tr>
<tr>
<td>HIST (300-level) Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Political Science:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POL 101</td>
<td>American Politics</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POL 371</td>
<td>Problems in Intl Politics</td>
<td>3</td>
</tr>
<tr>
<td>or POL 471</td>
<td>American Foreign Policy I</td>
<td></td>
</tr>
<tr>
<td>or POL 472</td>
<td>American Foreign Policy II</td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

Major Notes:  
1. A minimum GPA of 2.75 is required for a major.  
2. For the major, at least 12 semester hours must be in courses numbered 300 or above.  
3. 15 semester hours in UM-Dearborn courses required for a major.

Program Notes:

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.  
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.  
3. Minimum GPA's are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.  
4. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.  
5. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.  
6. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.  
7. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.  
8. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.

Secondary Certification Teaching Major/Minor Spanish

Major Requirements

A minimum of 30 semester hours of coursework beyond second-year proficiency is required.

Prerequisite: SPAN 202 or equivalent Spanish language proficiency (hours do not count toward major).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPAN 301</td>
<td>Adv Conversation and Comp I</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 302</td>
<td>Advan Conversation Comp II</td>
<td>3</td>
</tr>
<tr>
<td>One specialized language course, such as:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPAN 305</td>
<td>Language of Business</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 310</td>
<td>Intro to Hispanic Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>One civilization course, such as:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPAN 321</td>
<td>Spanish Food and Cuisine</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 353</td>
<td>Latino Literature</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 356</td>
<td>Spanish Civilization and Cult</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 357</td>
<td>Latin American Civiliztn Cult</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 358</td>
<td>Spain in the Twentieth Century</td>
<td>3</td>
</tr>
</tbody>
</table>
One literature course, such as:  
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 350</td>
<td>Masterpiece of Latin Amer Lit</td>
</tr>
<tr>
<td>SPAN 351</td>
<td>Masterpieces of Spanish Lit</td>
</tr>
<tr>
<td>SPAN 451</td>
<td>Spanish Film</td>
</tr>
</tbody>
</table>

Two 400-level language courses, such as:  
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 406</td>
<td>Advanced Written Expression</td>
</tr>
<tr>
<td>SPAN 409</td>
<td>Oral Expression</td>
</tr>
<tr>
<td>SPAN 420</td>
<td>Introduction to Translation</td>
</tr>
</tbody>
</table>

One visual culture course, such as:  
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 450</td>
<td>Hispanic Cinema</td>
</tr>
<tr>
<td>SPAN 451</td>
<td>Spanish Film</td>
</tr>
</tbody>
</table>

Elective credit hours from other Spanish area offering: 7-8

Total Credit Hours 29-31

**Major Notes:**

1. A minimum GPA of 2.75 is required for a major.
2. 30 credit hours must be in courses numbered 300 or above.
3. At least 15 credit hours in UM-Dearborn courses are required for a major.
4. Majors must take at least one course that deals specifically with Spanish (peninsular) topics such as SPAN 351, SPAN 356, or SPAN 358 and at least one course that deals with the Latin American topics such as SPAN 350 or SPAN 357.
5. Majors are encouraged to strengthen their knowledge of Spanish language and Hispanic culture by participating in any of the approved study-abroad programs.

**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Undergraduate students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in minor, and 2.75 in Professional Studies.
4. For admission to Phase III of the teacher certification program, passing scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score of 480) and in Mathematics (passing score 530) are required. The SAT must have been passed on or after March 5, 2016.
5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
6. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
7. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
8. Initial certification program students must have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to student teaching.
9. Certified teachers pursuing an endorsement in a post-degree program must complete all program requirements and have passing scores on the appropriate MTTC subject area test reported to the University of Michigan-Dearborn College of Education, Health, and Human Services by electronic delivery or direct mail from Pearson Evaluation Systems prior to a recommendation being made to the State of Michigan Department of Education.
10. Candidates must pass the Oral Proficiency Interview at the “Advanced-Low” level of proficiency, as required by the Michigan Department of Education.

**Minor Requirements**

A minimum of 21-22 semester hours of coursework beyond second-year proficiency is required.

**Prerequisite:** SPAN 202 or equivalent Spanish language proficiency (hours do not count toward major).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 301</td>
<td>Adv Conversation and Comp I</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 302</td>
<td>Advan Conversation Comp II</td>
<td>3</td>
</tr>
<tr>
<td>EDD 497</td>
<td>Second Lang Tchg: Sec Level</td>
<td>1</td>
</tr>
<tr>
<td>SPAN 305</td>
<td>Language of Business</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 310</td>
<td>Intro to Hispanic Linguistics</td>
<td></td>
</tr>
<tr>
<td>SPAN 321</td>
<td>Spanish Food and Cuisine</td>
<td></td>
</tr>
<tr>
<td>SPAN 353</td>
<td>Latino Literature</td>
<td></td>
</tr>
<tr>
<td>SPAN 356</td>
<td>Spanish Civilization and Cult</td>
<td></td>
</tr>
<tr>
<td>SPAN 357</td>
<td>Latin American Civiliztn Cult</td>
<td></td>
</tr>
<tr>
<td>SPAN 358</td>
<td>Spain in the Twentieth Century</td>
<td></td>
</tr>
<tr>
<td>SPAN 350</td>
<td>Masterpiece of Latin Amer Lit</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 351</td>
<td>Masterpieces of Spanish Lit</td>
<td></td>
</tr>
<tr>
<td>SPAN 465</td>
<td>Contemporary Spanish Lit</td>
<td></td>
</tr>
<tr>
<td>SPAN 406</td>
<td>Advanced Written Expression</td>
<td>2-3</td>
</tr>
<tr>
<td>SPAN 409</td>
<td>Oral Expression</td>
<td></td>
</tr>
<tr>
<td>SPAN 420</td>
<td>Introduction to Translation</td>
<td></td>
</tr>
<tr>
<td>SPAN 450</td>
<td>Hispanic Cinema</td>
<td></td>
</tr>
<tr>
<td>SPAN 451</td>
<td>Spanish Film</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 21-22

**Notes:**

1. A minimum GPA of 2.75 is required for a minor.
2. 20 credit hours must be in courses numbered 300 or above.
3. Minors must take at least one course that deals specifically with Spanish (peninsular) topics such as SPAN 351, SPAN 356, or SPAN 358 and at least one course that deals with the Latin American topics such as SPAN 350 or SPAN 357.
4. Minors are encouraged to strengthen their knowledge of Spanish language and Hispanic culture by participating in any of the approved study-abroad programs.

5. Candidates must pass the Oral Proficiency Interview at the "Advanced-Low" level of proficiency, as required by the Michigan Department of Education.

Secondary Certification Teaching Minor Speech

Minor Requirements

A minimum of 22 semester hours is required.

Prerequisite: SPEE 101 and COMM 220 (hours not counted toward minor).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIBR 470</td>
<td>Literature for Young People</td>
<td>3</td>
</tr>
<tr>
<td>EDD 441</td>
<td>Practicum: English Second Grd</td>
<td>1</td>
</tr>
</tbody>
</table>

Select four courses from the following with faculty advisement in the College of Arts, Sciences, and Letters and the College of Education, Health, and Human Services:

- SPEE 310 Interpersonal Communication
- SPEE 320 Public Argument and Advocacy
- SPEE 330 Argumentation and Debate
- SPEE 340 Persuasion & Social Movements
- SPEE 430 Small Group Communication

Select two courses from the following:

- JASS 302 Media Law and Ethics
- COMM 420 Critical Media Studies
- COMM 430 International Communications

Total Credit Hours 22

Notes:

1. A minimum GPA of 2.75 is required for a minor.
2. The 22 semester hours must be in courses numbered 300 or above.
3. It is strongly recommended that students elect JASS 302 and COMM 420.

Social Services Technician

The Social Services Technician (SST) Certificate prepares students for a wide variety of employment options within the social services profession. The SST Certificate provides understanding and experience with the methods, skills, and critical theories that support effective work. In addition, students come away prepared to meet the professional standards and engage in the expected behaviors of persons licensed to work in a social services setting at the paraprofessional level. Completion of the certificate prepares participants to qualify and pursue registration as a Social Service Technician under the Michigan Bureau of Health Professions.

Program Goals

Upon completion of the SST certificate, students will demonstrate the ability to:

1. Apply critical thinking skills within the context of professional social work practice;
2. Understand the value base of the profession's ethical standards and principles including practice without discrimination and with respect;
3. Understand and interpret the history of the social work profession, contemporary structures and issues;
4. Use theoretical frameworks supported by empirical evidence to understand individual development and behavior across the lifespan and within families, groups, organizations and communities;
5. Use communication skills differentially within client populations, with colleagues and communities, and work collaboratively within the structure of organizations and service delivery systems.

Certificate Requirements (18 - 22 credit hours)

Social Services Technician Core Requirements (12 credit hours)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>or EDC 302</td>
<td>Adol Devl &amp; Classroom Mgmt</td>
<td></td>
</tr>
<tr>
<td>EDC 306</td>
<td>Applied Behavior Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>CHE 201</td>
<td>Medical Terminology</td>
<td>3</td>
</tr>
<tr>
<td>or HHS 202</td>
<td>Mental Health Terminology</td>
<td></td>
</tr>
<tr>
<td>SWK 200</td>
<td>Intro to Social Work</td>
<td>3</td>
</tr>
<tr>
<td>or CHE 101</td>
<td>Intro to Health Education</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 12

Social Services Technician Specialty Courses (6 credit hours - Choose two course from the following)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 439</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>HHS 370</td>
<td>Medicine and Addiction I</td>
<td>3</td>
</tr>
<tr>
<td>SWK 300</td>
<td>Theories and Practices</td>
<td>3</td>
</tr>
<tr>
<td>SWK 301</td>
<td>Intro to Macro Social Work</td>
<td>3</td>
</tr>
<tr>
<td>SWK 302</td>
<td>Family Preservation</td>
<td>3</td>
</tr>
<tr>
<td>SWK 305</td>
<td>Case Management for Change</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 6

Additional Job-Ready Courses and Experiences (The following are optional choices that can assist students in preparing for professional SST employment; could include 1-4 credit hours.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 402</td>
<td>Internship CHE</td>
<td>3</td>
</tr>
<tr>
<td>PDED 418</td>
<td>Topics in Education</td>
<td>1</td>
</tr>
<tr>
<td>Crisis Prevention Institute Training (CPI)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Basic First Aid - Red Cross
CPR/AED Training
Mental Health First Aid
Bloodborne Pathogens Certification
Background Check and Fingerprinting

Total Credit Hours 4-6

Social Studies

Help young learners understand the social forces that shape our society. From the study of history to understanding how our government works, social studies curriculum is essential for young citizens.

This program will train you in the latest strategies for teaching students about the important cultural, economic, geographic, political and social dimensions of human society, with an emphasis on evidence-based lessons and creative projects that enhance learning.

A bachelor’s degree in social studies with elementary teacher certification will prepare you to teach all subjects in grades K–5; or with the social studies major, you can become certified to teach social studies subjects in grades 6–8. Plus, with successful completion of the program, you’ll earn both a bachelor’s degree and faculty recommendation for the Michigan Elementary Standard Certificate.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course


Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Core Course Requirements

Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 220</td>
<td>Science in the Elem School</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 283</td>
<td>History &amp; Civics Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 284</td>
<td>Geography &amp; Econ Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

Required for Early Childhood and Special Education Majors

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LING 280</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>LIBR 465</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>MATH 385</td>
<td>Math for Elem Teachers I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 386</td>
<td>Math for Elem Teachers II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 387</td>
<td>Math for Elem Teachers III</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 231</td>
<td>Inquiry: Physical Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 232</td>
<td>Inquiry:Earth/Planet Science</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 233</td>
<td>Inquiry: Life Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 42

1 Two of the three NSCI core courses may be transferred to UM-Dearborn. A) an introductory physical science will satisfy NSCI 231, B) an introductory earth/geology science will satisfy NSCI 232, and C) an introductory life science course will satisfy NSCI 233.

Pre-Professional Requirements

Pre-professional courses are generally completed in the freshman and sophomore year.
Program Notes:

Major Notes:

1. A minimum of 36 semester hours from the following:

2. Total Credit Hours

3. Required Courses

4. Social Work

5. Minor Requirements

6. Major Requirements

7. Required Courses

8. Elective

9. Major Notes:

10. Program Notes:

11. SW Minor Contexts Requirement (3 credit hours - select 1 course)
The Dearborn Discovery Core

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Core Course Requirements**

Core courses are generally completed in the freshman and sophomore year.

Selections must be from courses numbered 100-200 unless otherwise stated.

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>COMP 105</td>
<td>Writing &amp; Rhetoric I</td>
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<td>EXPS 220</td>
<td>Science in the Elem School</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 282</td>
<td>History &amp; Civics Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 283</td>
<td>Geography &amp; Econ Elem Schools</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 298</td>
<td>Exp Writing-Comm Learn&amp;Tch</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 420</td>
<td>Science Capstone</td>
<td>3</td>
</tr>
<tr>
<td>LING 280</td>
<td>Introduction to Linguistics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Special Education**

Special education teachers use our expertise and creativity to create rich educational experiences for all our students — regardless of ability.

As a learning disabilities major, you’ll train to be an educator who works capably and compassionately with students who have intellectual, social or behavioral challenges. Throughout the program, you’ll explore the newest methods for assisting learners with diverse needs, learn to use technology effectively in the 21st-century classroom, and complete multiple field experiences that put you side-by-side with students in local schools.

Plus, this bachelor’s degree comes with a faculty recommendation for the Michigan Elementary Standard Certificate with the Learning Disabilities Endorsement.

**Dearborn Discovery Core Requirement**

The Dearborn Discovery Core Requirement (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)
A minimum of 30 semester hours from the following:

**Pre-Professional Requirements**

Pre-professional courses are generally completed in the freshman and sophomore year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 205</td>
<td>Introduction to Education</td>
<td>3</td>
</tr>
<tr>
<td>EDA 419</td>
<td>Early Literacy/Language Develop</td>
<td>3</td>
</tr>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 241</td>
<td>Psych: Child Devel Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDF 450</td>
<td>Hlth, Nutr, &amp; PE/Clsrm Tchr</td>
<td>2</td>
</tr>
<tr>
<td>EDT 211</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 250</td>
<td>Elem Ed Vis &amp; Perf Arts</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 407</td>
<td>Inquiry-based Math and Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 21

**Major Requirements**

A minimum of 30 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 401</td>
<td>Introduction to LD</td>
<td>3</td>
</tr>
<tr>
<td>EDN 403</td>
<td>Assessment of the Learner</td>
<td>3</td>
</tr>
<tr>
<td>EDN 404</td>
<td>Assessment Practicum</td>
<td>1</td>
</tr>
<tr>
<td>EDN 401</td>
<td>Strategies for LD</td>
<td>3</td>
</tr>
<tr>
<td>EDN 402</td>
<td>Socio-vocational Transitions</td>
<td>3</td>
</tr>
<tr>
<td>PDED 405</td>
<td>Sp Ed Legisln and Litigation</td>
<td>3</td>
</tr>
<tr>
<td>EDC 417</td>
<td>Mgmt of Classroom Behavior</td>
<td>3</td>
</tr>
<tr>
<td>EDC 240</td>
<td>Psych of Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDT 430</td>
<td>Assistive Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDD 413</td>
<td>LD Elem Directed Teaching</td>
<td>2</td>
</tr>
<tr>
<td>EDD 420</td>
<td>LD Sec Directed Teaching</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credit Hours 31

**Program Notes:**

1. All College of Education, Health, and Human Services undergraduate students are required to take the Composition Placement Test by the end of the first semester they are enrolled in classes.
2. Students transferring in COMP 105 or COMP 106, but receiving the prescription of 099 from the Composition Placement Test, must complete COMP 227 before taking EDD courses.
3. Minimum GPA’s are required for program completion: 2.75 cumulative, 2.75 in major, 2.75 in optional minor(s), and 2.75 in Professional Studies.
4. For admission to Phase III of the teacher certification program, passing scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score of 480) and in Mathematics (passing score 530) are required. The SAT must have been passed on or after March 5, 2016.
5. Advising Policy: The student is responsible for complying with requirements described in the Undergraduate Catalog as well as on the Four Phase Checklist. Students are expected to meet with their College of Education, Health, and Human Services advisor at least once per year and in the term prior to graduation.
6. Courses taken on a PASS/FAIL basis will NOT be accepted toward program completion.
7. The minimum number of semester hours required to graduate is 128.
8. CEHHS recommends successful program completers for State of Michigan Certification, however, it is ultimately up to the State of Michigan to issue certificates. Certain offenses on a criminal record can keep individuals from obtaining teacher certification. Please refer to The Revised School Code, Act 451 of 1976, section 380.1539b.
9. Students must meet Dearborn Discovery Core requirements. See http://umdearborn.edu/696973/ for details.

**STEM2: Multidisciplinary Certificate**

**A Multidisciplinary Certificate in Science, Technology, Engineering, Mathematics and Medicine**

The STEM²: A Multidisciplinary Undergraduate Certificate is designed to enhance students’ content knowledge in science, technology, engineering, mathematics and medicine, and to assist students in integrating their knowledge of each of these disciplines.

Students with this certificate will be well prepared to work for industrial firms that perform outreach activities into K-12 classrooms. They would also be ideal candidates for employment by museums of science and/or industry which seek employees who can work with K-12 students by leading activities or by designing interactive exhibits exploring the intersections of science, technology, engineering, mathematics and health. Secondary teacher certification students may choose this certificate to gain multidisciplinary knowledge of STEM² in addition to their selected major/minor for teaching.

The UM-Dearborn certificate, which requires a minimum of 15 credit hrs, includes a broad, multidisciplinary group of courses to provide foundational knowledge for students interested in STEM²: Science, Technology, Engineering, Mathematics and Medicine.
Program Goals:
The UM-Dearborn STEM\textsuperscript{2}: A Multidisciplinary Undergraduate Certificate has the following goals for students in the program. Students will be:

1. Aware of the nature of STEM\textsuperscript{2} disciplines.
2. Knowledgeable in issues related to STEM\textsuperscript{2} disciplines in education and society.

To view application forms and admission information, please click here (https://umdearborn.edu/cehhs/professional-development-training/certificates/undergraduate-certificate-programs/).

Certificate Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select One STEM\textsuperscript{2} Course:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXPS 400   STEM\textsuperscript{2} Teaching and Learning</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>EXPS 450   Issues in STEM\textsuperscript{2} and STEM\textsuperscript{2} Ed</td>
<td>3</td>
</tr>
</tbody>
</table>

Select the Engineering Course:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>2</td>
</tr>
</tbody>
</table>

Select One Additional Science Course with Lab: One Natural Sciences course beyond the 7 credit hours required for the Dearborn Discovery Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select One Statistics Course:</td>
<td></td>
</tr>
<tr>
<td>STAT 263</td>
<td>Introduction to Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

Select One Medical/Health Course:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 101</td>
<td>Intro to Health Education</td>
<td>3</td>
</tr>
<tr>
<td>HHS 200</td>
<td>Introduction to Public Health</td>
<td></td>
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<tr>
<td>HPS 430</td>
<td>Health Behavior &amp; Health Educ</td>
<td></td>
</tr>
<tr>
<td>HPS 442</td>
<td>Medical Ethics</td>
<td></td>
</tr>
</tbody>
</table>

Total 15 Credit Hours Required

Certificate Requirements:

1. Current enrollment at UM-Dearborn
2. An overall GPA of at least 2.75
3. Completion of the Declaration of Certificate form
4. Completion of the required coursework with a GPA of at least 2.75

Teaching English to Speakers of Other Languages

Teaching English to Speakers of Other Language (TESOL)

There are many opportunities for teaching English to speakers of other languages (TESOL). The UM-Dearborn certificate program is specifically designed for individuals seeking opportunities locally or internationally and will prepare students with the requisite content knowledge and pedagogy to teach English to students or adults outside of the PK-12 public school system. Certificate holders may find careers with non-U.S. agencies/institutions in order to meet international needs to provide English instruction to their student populations.

This certificate does not lead to state teacher certification or a state endorsement. For those interested in PK-12 certification, please refer to the ESL endorsement.

The TESOL Certificate Program requires 15 undergraduate credit hours.

Program Goals:
The TESOL Certificate Program goals are twofold:

• Provide students with the requisite content knowledge and pedagogy to teach English to non-native speakers locally and abroad in short- or long-term English language programs.
• Provide non-native English speakers who are currently teaching abroad with the requisite content knowledge and pedagogy to effectively teach their non-native English-speaking students.

How to Apply:

• For current UM-Dearborn students, please complete the Declaration of Certificate form (https://umich.app.box.com/s/d72ond18nnqfpdvsvaxxb6hm304xb/).
• For individuals not enrolled in a UM-Dearborn degree program, please complete the Certificate Program Application (https://umdearborn-portal.force.com/application/TX_SiteLogin/?startURL=).

Certificate Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EDA 455</td>
<td>Lang,Clture,Litrcy &amp; Power Ed (Language, Literacy, Culture &amp; Power in Ed)</td>
<td>3</td>
</tr>
<tr>
<td>EDC 455</td>
<td>Assmt: Sec Lang Learning K-12</td>
<td>2</td>
</tr>
<tr>
<td>EDD 447</td>
<td>Tchng English as Second Lang</td>
<td>3</td>
</tr>
<tr>
<td>EDD 448</td>
<td>Pract: Tchng Engl Secnd Lang</td>
<td>1</td>
</tr>
<tr>
<td>EDM 405</td>
<td>TESOL Strategies for Classrm</td>
<td>2</td>
</tr>
<tr>
<td>EDM 4100</td>
<td>Teach Eng Specific Purposes (Teaching English for Specific Purposes)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>1</td>
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</table>

Total Credit Hours 15
College of Engineering and Computer Science

Engineering: The Profession

Engineers are the link between scientific knowledge and practical applications. Engineers combine various roles and functions in their job. What are engineers?

- Engineers are science-knowledgeable individuals who use mathematics, chemistry, and physics for an applied purpose.
- Engineers invent, design, or improve products that people want to buy or use.
- Engineers are business people who design, manufacture, or sell a technical product or service to customers, taking into consideration safety, cost, quality, reliability, societal impact, and ease of use.
- Engineers are planners and integrators who bring together skills and knowledge from many disciplines and fields for some technical purpose or application.
- Engineers are creative problem-solvers and doers: they make decisions and get things done in a combined science/technical/business/applied profession.
- Engineers analyze problems, develop design solutions, and pay close attention to detail.
- Engineers interact with a variety of people, including clients, scientists, other engineers, technicians, managers, and government officials.
- Engineers are interested in how and why things work and like practical challenges.
- Successful engineers are known for their analytical, imaginative, and creative skills, for using common sense, for being team players, for being able to pick up new knowledge and skills quickly, and for their commitment to continue to improve and learn.


Computer Science: The Profession

Computer and information scientists offer expertise in the effective and efficient use of computers for tackling a broad spectrum of practical challenges, usually in a team environment. Computer and information science includes the following sub-specialties: operating systems, compilers, computer graphics, computer game design, computer networks and network administration, security, enterprise computing technologies, information and database systems and database administration, information retrieval, artificial intelligence and machine learning, robotics, theoretical computer science, programming languages, software engineering and web technologies. Software engineering is the area within computer science that is concerned with the theoretical and practical aspects of the detailed design, building, testing, modification, optimization, and maintenance of large, high quality, software systems for a wide range of applications across society. Software engineers analyze users’ needs and work as part of a core team to design, create, and implement high quality and cost effective new software, computer applications, and utility programs. A core team may be composed of software engineering, manufacturing, design, management, and marketing people who work together until the software product is released and implemented.

Data scientists use programming, mathematics/statistics, and modeling skills to convert data for companies, governments, and other institutions into actionable information and insight. Digital Forensics is the area of computer science concerned with the examination and analysis of computer hard drives, storage devices, cell phones, PDAs or any electronic device that may hold evidence that could be used in a court of law. The digital forensics analyst uncovers and preserves data for later use as legal evidence, and analyzes the data in light of a particular crime or criminal or civil investigation. Cybersecurity and Privacy is the area of computer science concerned with fundamental security and privacy concepts including confidentiality, integrity, access control, security architecture and systems, and attack/defense in various application areas, ranging from computer security to network security, from wired security to wireless security, from data security to application security, from every day security to enterprise security.

The College of Engineering and Computer Science offers undergraduate degrees in four computer science fields: Computer and Information Science, Cybersecurity and Information Assurance, Data Science, and Software Engineering.

Career Choice

What can help students to decide to pursue a career in engineering or computer science? Some of the clues are an interest in and successful completion of science, mathematics, and computer science courses; a desire and ability to investigate the “why” as well as the “how” of things; and an interest in the creative development of devices or systems that meet specific needs. Not all of these signs or interests will fit everyone, but they can be used as a guide.

The College of Engineering and Computer Science, Office of Advising and Academic Success, has online information about careers in engineering and computer science and a number of links to very informative external web sites.

Individuals with interests in using science and mathematics to benefit others will find that engineering and computer science professions offer a wide variety of career and employment choices and opportunities.

Admissions counselors at UM-Dearborn and academic advisors of the College of Engineering and Computer Science are glad to talk with students about career choices or choosing the school that best suits their interest and abilities. Prospective students are welcome to contact the College of Engineering and Computer Science and to read the information on the College’s web page.

Educational Goals and Programs

The mission of the College of Engineering and Computer Science is to be a leader in providing quality undergraduate and graduate programs in an environment integrated with engineering practice, research, and continuing professional education, in close partnership with the industrial community.

The College of Engineering and Computer Science’s (CECS) educational objective is to prepare its students to take positions of leadership commensurate with their interests and abilities in a world where science, engineering, and human relations are of basic importance.

Programs of study integrate fundamental mathematical and scientific theory with experiments, advanced analysis, and design practice to
produce the coherent educational preparation required of professional engineers and computer scientists.

Both the CECS academic curriculum and cooperative education placements are planned to prepare students to become practicing engineers or computer scientists, administrators, or investigators. The knowledge, skills, and discipline gained from the CECS degree programs are broad and fundamental and also constitute excellent preparation for other careers, such as law and medicine.

**Undergraduate Requirements**

The College of Engineering and Computer Science (CECS) offers undergraduate programs leading to the Bachelor of Science in Engineering (BSE) degree in the following fields: Bioengineering, Computer Engineering, Electrical Engineering, Industrial and Systems Engineering, Manufacturing Engineering, Robotics Engineering, and Mechanical Engineering. (Students in these BSE programs may also choose to earn a concurrent second degree in Engineering Mathematics.) The College also offers an undergraduate degree program leading to a Bachelor of Science (BS) in the following fields: Computer and Information Science (CIS), Cybersecurity and Information Assurance (CIA), Data Science, and Software Engineering. The CIS program has three concentrations: computer science, information systems, and game design. The CIA program has two concentrations: digital forensics and cybersecurity and privacy. (Students in these BS programs may also choose to earn a concurrent second degree in CIS Mathematics.)

The minimum credit-hour requirement for the degree programs in engineering is 125 to 128 semester credits, depending on the specific major. The BS in Software Engineering, Data Science, Cybersecurity and Information Assurance, or in Computer and Information Science requires a minimum of 120 to 123 semester credits of course work, depending on the specific major.

CECS students can also choose from several concurrent undergraduate degree programs, an opportunity to earn two engineering or computer science degrees by completing an additional 15-18 credits.

The scholastic requirements for graduation are given under “Requirements for Graduation” section of this Catalog. For the detailed requirements specified by the College of Engineering and Computer Science for each of its undergraduate programs, see the sections for each program below.

Students have the option of earning a minor in addition to their major. CECS offers a minor in Computer and Information Science. The College of Arts, Sciences, and Letters and the College of Business offer various minors of interest to CECS students. See the relevant sections of this Catalog.

The CECS Office of Advising and Academic Success, 2000 Heinz Prechter Engineering Complex (HPEC), 313-593-5510, und-cecs-undergrad@umich.edu, is the primary contact for undergraduate students for academic advising and for information about all undergraduate degree programs of the College of Engineering and Computer Science.

**Admission to the College of Engineering and Computer Science**

Starting in Fall 2019, undergraduate students interested in Engineering or Computer Information Science majors can be admitted into the College of Engineering and Computer Science (CECS) in one of two ways:

1. **Admission directly into a CECS major**

   **Freshman Requirements for Direct Admission:**
   - Students with a GPA of 3.5 or higher AND an SAT of 1200 or higher (ACT of 25 or higher), or
   - Students who have completed at least Pre-Calculus (Math 105 or equivalent) with a C grade or higher OR place into Calculus 1 (Math 115) or higher on their placement exam.

   **Transfer Requirements for Direct Admission:**
   - Students who have completed Calculus II (Math 116 or equivalent) elsewhere with a C grade or higher AND have an overall GPA of 2.75 or higher.

2. **Admission into the Pre-Engineering Program**

   **Freshman Requirements:**
   - Students who satisfy the university’s undergraduate admissions standards, but do not meet the above admission criteria for direct into CECS.

   **Transfer Requirements:**
   - Students will be required to show an overall transfer GPA of 2.75 or higher.

   **What is Pre-Engineering?**

   This program is designed to support students in building a stronger math and science foundation to be successful in the rigorous CECS curriculum. Pre-Engineering students will have excellent campus support in developing the fundamental knowledge our faculty have identified as key predictors of success in the engineering and computer science fields.

   **Transitioning from Pre-Engineering into a CECS Major:**

   Pre-Engineering students will work closely with Academic Advisors to enroll in appropriate classes to help ensure their chances are optimized to be successful in the intensive curriculum that lies ahead. Students following the Pre-Engineering path are expected to complete the transition expectations (below) within one calendar year or within their first 30 credit hours at UM-Dearborn, whichever comes first. At the completion of one year or 30 credit hours, students are required to declare a major in CECS (if they qualify), or in a different academic college on campus (if they do not qualify). Some students may complete their Pre-Engineering coursework within one semester.

   - Freshmen can transition once they successfully complete Pre-Calculus (Math 105) with a C grade or higher AND complete General Chemistry I (Chem 134 or 144) with a C grade or higher.
   - Transfer students can transition once they successfully complete Calculus II (Math 116) with a C grade or higher.
   - All students transitioning into a CECS major are expected to be in good academic standing overall (2.0 GPA or higher).
CECS Office of Advising and Academic Success

The College of Engineering and Computer Science (CECS) Office of Advising and Academic Success is the primary contact for undergraduate students for academic advising and for information about all undergraduate CECS programs. The office provides the following services to CECS undergraduate students:

- academic advising of new and continuing students
- evaluation of transfer credits, admission of cross-campus transfer applicants
- coordination of registration, drops, adds, and total withdrawals
- handling of petitions and individual requests
- degree audits of students’ credits toward graduation
- placement and release of academic holds
- handling of academic (probationary) actions and petitions
- readmission of previously enrolled students
- final certification of degree completion.


Majors

- Bioengineering (p. 608) (also offered as Dual Degree)
- CIS Mathematics (p. 612)
- Computer and Information Science (p. 613) (also offered as Dual Degree)
- Computer Engineering (p. 622) (also offered as Dual Degree)
- Cybersecurity and Information Assurance (p. 632) (also offered as Dual Degree)
- Data Science (p. 634) (also offered as Dual Degree)
- Electrical Engineering (p. 646) (also offered as Dual Degree)
- Engineering Mathematics (p. 656)
- Industrial and Systems Engineering (p. 657) (also offered as Dual Degree)
- Manufacturing Engineering (p. 663) (also offered as Dual Degree)
- Mechanical Engineering (p. 669) (also offered as Dual Degree)
- Robotics Engineering (p. 676)
- Software Engineering (p. 678)

Minors

- Computer and Information Science (p. 616)

Certificates

- Practical Aspects of Computer Security (p. 675)

Dual Degree Programs

- BSE, Bioengineering/Mechanical Engineering (p. 636)
- BS, Computer and Info Systems/Cybersecurity (p. 638)
- BS, Computer and Info Systems/Data Science (p. 639)
- BSE, Electrical/Computer Engineering (p. 641)
- BSE, Industrial and Systems Engineering/Manufacturing Engineering (p. 642)
- BSE, Manufacturing/Mechanical Engineering (p. 644)

Administration

Tony England, PhD, Dean
Ghassan Kridli, PhD, Associate Dean for Undergraduate Education
Yi Lu Murphey, PhD, Associate Dean for Graduate Education and Research
John Cristiano, PhD, Director, Henry W. Patton Center for Engineering Education and Practice, and Institute for Advanced Vehicle Systems
Anthony DeLaRosa, MA, Assistant Director, Experiential Learning and Co-op Education
M. Jeanne Girard, MPA, Director, Office of Extended Learning and Outreach
Eric Kirk, Director, Lab Safety
Leigh McGrath, BS, Director, Business Operations
Lisa Remsing Hall, PhD, Director, Advising and Academic Success

Chairs and Directors

Ben Q. Li, Chair, Department of Mechanical Engineering
Paul Richardson, Chair, Department of Electrical and Computer Engineering
Armen Zakarian, Chair, Department of Industrial and Manufacturing Systems Engineering
Qiang Zhu, Chair, Department of Computer and Information Science

Professors Emeriti

Aswad, A. Adnan, PhD, Professor Emeritus of Industrial and Manufacturing Systems Engineering
Boffi, Luiz V., ScD, Professor Emeritus of Electrical and Computer Engineering
Bolling, Fredric, PhD, Professor Emeritus of Mechanical Engineering
Cairns, J. Robert, PhD, Professor Emeritus of Mechanical Engineering
Chang, Chia-hao, PhD, Professor Emeritus of Industrial and Manufacturing Systems Engineering
Conlon, Howard E., MS, Associate Professor Emeritus of Mechanical Engineering
Despres, Thomas A., PhD, Professor Emeritus of Mechanical Engineering
Habib, Izzeddin S., PhD, Professor Emeritus of Mechanical Engineering
Heim, Dwight S., PhD, Professor Emeritus of Electrical Engineering
Kachhal, Swatantra K., PhD, Professor Emeritus of Industrial and Manufacturing Systems Engineering
Kampfner, Roberto, PhD, Associate Professor Emeritus of Computer and Information Science
Knight, James W., PhD, Associate Professor Emeritus of Industrial and Manufacturing Systems Engineering
Murtuza, Syed, PhD, Professor Emeritus of Electrical and Computer Engineering
Riordan, John, MS, Professor Emeritus of Computer and Information Science
Sullivan, Joseph E., MS, Associate Professor Emeritus of Electrical and Computer Engineering
Tsui, Louis, PhD, Associate Professor Emeritus of Computer and Information Science
Wolf, Louis W., PhD, Associate Professor Emeritus of Mechanical Engineering

Faculty
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Elenbogen, Bruce, PhD, Northwestern University, Associate Professor of Computer and Information Science
Grosky, William I., PhD, Yale University, Professor of Computer and Information Science
Guo, Jinhua, PhD, University of Georgia, Assistant Professor of Computer and Information Science
Kessentini, Marouan, PhD, University of Montreal, Assistant Professor of Computer and Information Science
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Neji, Sana, MBA\MS, University of Quebec, Lecturer III of Computer and Information Science
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Xu, Zhuiwei, PhD, Florida Atlantic University, Assistant Professor of Computer and Information Science
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Zhu, Qiang, PhD, University of Waterloo, Professor of Computer and Information Science

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Malik, Hafiz, PhD, University of Illinois at Chicago, Associate Professor of Electrical and Computer Engineering
Miller, John, PhD, University of Toledo, Associate Professor of Electrical and Computer Engineering
Murphey, Yi Lu, PhD, University of Michigan, Professor of Electrical and Computer Engineering
Putty, Michael, PhD, University of Michigan, Lecturer III of Electrical and Computer Engineering
Rawashdeh, Samir, PhD, University of Kentucky, Assistant Professor of Electrical and Computer Engineering
Richardson, Paul C., PhD, Oakland University, Professor of Electrical and Computer Engineering
Shaout, Adnan, PhD, Syracuse University, Professor of Electrical and Computer Engineering
Shridhar, Malayappan, PhD, University of Aston, Professor of Electrical and Computer Engineering
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Xiang, Weidong, PhD, Tsinghua University, Professor of Electrical and Computer Engineering

Yi, Yasha, PhD, Massachusetts Institute of Technology, Associate Professor of Electrical and Computer Engineering

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**Department of Mechanical Engineering**

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Ghosh, Gargi, PhD, University of Kentucky, Associate Professor of Bioengineering

Huntley, Hugh, PhD, University of Michigan, Associate Professor of Mechanical Engineering

Jung, Dohoy, PhD, University of Michigan, Associate Professor of Mechanical Engineering

Kanapathipillai, Mathumai, PhD, Iowa State University, Assistant Professor of Bioengineering

Kang, Hong Tae, PhD, University of Alabama, Professor of Mechanical Engineering

Kim, Youngki, PhD, University of Michigan, Assistant Professor of Mechanical Engineering

Li, Ben Q., PhD, University of California-Berkeley, Professor of Mechanical Engineering

Little, Robert E., PhD, University of Michigan, Professor of Mechanical Engineering

Lo, Joe Fu-Jiou, PhD, University of Southern California, Assistant Professor of Bioengineering

Mallick, Pankaj K., PhD, Illinois Institute of Technology, Professor of Mechanical Engineering

Mei, Carole, PhD, University of Auckland, Professor of Mechanical Engineering

Mohanty, Pravansu, PhD, McGill University, Professor of Mechanical Engineering

Ratts, Eric, PhD, Massachusetts Institute of Technology, Associate Professor of Mechanical Engineering

Reyes-Villanueva, German, PhD, University of Liverpool, Associate Professor of Mechanical Engineering

Sengupta, Subrata, PhD, Case Western Reserve University, Professor of Mechanical Engineering

Shim, Taehyun, PhD, University of California-Davis, Professor of Mechanical Engineering

**Department of Industrial Manufacturing Systems Engineering**

Ayoub, Georges Y., PhD, University of Lille, Assistant Professor of Industrial and Manufacturing Systems Engineering

Chehade, Abdallah, PhD, University of Wisconsin-Madison, Assistant Professor of Industrial and Manufacturing Systems Engineering

Chen, Xi, PhD, University of Minnesota, Assistant Professor of Industrial and Manufacturing Systems Engineering

Chen, Yubao, PhD, University of Wisconsin-Madison, Professor of Industrial and Manufacturing Systems Engineering

Hu, Jian, PhD, Northwestern University, Assistant Professor of Industrial and Manufacturing Systems Engineering

Hu, Zhen, PhD, Missouri University of Science and Technology, Assistant Professor of Industrial and Manufacturing Systems Engineering

Jia, Bochen, PhD, Virginia Polytechnic Institute and State University, Assistant Professor of Industrial and Manufacturing Systems Engineering

Kim, Sang-Hwan, PhD, North Carolina State University, Associate Professor of Industrial and Manufacturing Systems Engineering

Kridli, Ghassan, PhD, University of Missouri-Columbia, Professor of Industrial and Manufacturing Systems Engineering

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Liu, Yung-Wen, PhD, University of Washington, Associate Professor of Industrial and Manufacturing Systems Engineering

Orady, Elsayed A., PhD, McMaster University, Professor of Industrial and Manufacturing Systems Engineering

Tolbert, DeLean, PhD, Purdue University, Assistant Professor of Industrial and Manufacturing Systems Engineering

Ulgen, Onur, PhD, Texas Technological University, Professor of Industrial and Manufacturing Systems Engineering

Xi, Zhimin, PhD, University of Maryland, Assistant Professor of Industrial and Manufacturing Systems Engineering

Zakarian, Armen, PhD, University of Iowa, Professor of Industrial and Manufacturing Systems Engineering

Zhou, Feng, PhD, Georgia Institute of Technology, Assistant Professor of Industrial and Manufacturing Systems Engineering
Cooperative Education

The College of Engineering and Computer Science recognizes that experience-based learning, through cooperative education and internship programs, is an integral component to a student's college experience that provides life-changing learning opportunities. The Cooperative Education Program is an optional program for students who desire paid practical work experiences related to their academic program of study and to their career interest. Co-op students may perform their assignments in alternating semesters of full-time employment and full-time course work, or by completing the co-op assignments in the summer. Students who complete the Cooperative Education program requirements receive recognition on their transcripts.

Cooperative education assignments are supervised by representatives of both the University and the employer. The work experience is considered an integral part of the educational process, and both the College and the participating employer share responsibility for this integration. These assignments can be in-state or out-of-state. Students in the Cooperative Education Program are required to complete a minimum of two-credit hours (two co-op assignments) in order to receive the transcript recognition.

Students in the Computer and Information Science, Cybersecurity and Information Assurance, Data Science, and Software Engineering programs, may use (double count) the cooperative education credit towards fulfilling the basic requirements of their degrees. Students in all other programs in the college may use up to 1 (one) cooperative education credit towards fulfilling the basic requirements of their degree programs.

Students are encouraged to complete a minimum of two full-time work semesters with a participating employer; however, the assignments may be completed with different employers. Students may enroll in up to two academic classes concurrently with their cooperative education assignment.

Student Counseling and Placement

The Director of the CECS Cooperative Education Program counsels co-op students with respect to career interests and aptitudes, and arranges interviews with appropriate cooperating employers. These interviews furnish the opportunity for a professional work assignment that is agreeable to the University, the student and the employer.

Evaluation, Eligibility and Recognition of Achievement

Each student is formally evaluated by the employer. At the end of the cooperative education assignment (end of semester) the participating student submits a technical report to the faculty member responsible for the cooperative education class.

The grade for the cooperative education class is determined based on the quality of the technical report and the employer evaluation (details on the grading rubric will be provided to the students in the cooperative education course syllabus.) If the cooperative education assignment is counted for academic credit toward the degree, it is graded on a scale from A to E. However, if the cooperative education course is completed for additive credit, the assigned grade will be either S for satisfactory or NC (no credit) for unsatisfactory. Failure to submit the report by the due date will result in failing the course (receiving a grade of E or NC).

Students are eligible to participate in the Cooperative Education Program by meeting the pre-requisite courses required for enrolling in the cooperative education courses. These pre-requisite courses are specific to the student's academic program of study. Transfer students are eligible to participate in the Cooperative Education Program once they have completed one semester of enrollment in one of the academic programs offered by the College.

Both the cooperating employers and the University expect that students participating in the Cooperative Education Program will be able to demonstrate a considerable increase in academic knowledge after each term of classroom study. Therefore, participants in the CECS Cooperative Education Program must be full-time students during their alternated class terms; that is, must satisfactorily complete at least 12 credit hours of their degree program course work during each scheduled class term.

To earn cooperative education recognition on their transcripts, students must complete at least two full-time assignments. With prior registration, one cooperative education credit-hour may be earned for each full-time cooperative education assignment. A full-time assignment requires at least 35 hours of work per week for 12 to 15 consecutive weeks.

In engineering programs, with pre-approval by the engineering academic program faculty, one of the cooperative education assignments may also be counted for academic credit (i.e. to satisfy the requirements of the undergraduate degree program.) In such a case, the requirements for the Cooperative Education Program can be fulfilled with only one additional credit hour of cooperative education beyond the requirements of the degree program. In the Computer and Information Science program, the Cybersecurity and Information Assurance program, the Data Science program, and the Software Engineering program, both of the cooperative education assignments may be completed for academic credit towards the undergraduate degree program.

Admission to the Cooperative Program

Students who have completed the pre-requisite courses and have good academic standing, can join the CECS Cooperative Education Program. Typically, students meet these requirements towards the end of their sophomore year. Transfer students admitted to the CECS are eligible to participate in the Cooperative Education Program after completing one semester as a full-time student, or 12 credit hours. A GPA of at least 2.30 is a pre-requisite to admission into the program.

The courses of this basic requirement include the calculus sequence, differential equations, linear algebra, college chemistry, the engineering physics sequence, and introductory courses in engineering that include computer-aided tools for design and analysis.

In addition to the basic entrance-level requirement there are also specific courses that must be satisfactorily completed before beginning the first co-op work period. These specific courses, which differ according to the degree programs, are all courses normally scheduled in the sophomore year under CECS's basic freshman-sophomore curriculum (the equivalent course at another college may be acceptable for a transfer student).

- For students majoring in computer and information science, cybersecurity and information assurance, data science, or software engineering.

Varde, Keshav S., PhD, University of Rochester, Professor of Mechanical Engineering

Zhang, Yi, PhD, University of Illinois at Chicago, Professor of Mechanical Engineering

Zikanov, Oleg, PhD, Moscow State University, Professor of Mechanical Engineering
strongly recommended to discuss their overall workload (academic and 

However, students pursuing an internship are 

Internships are part-time employment, they do not require registration 

students are paid by their employers for internship assignments. Since 

not receive transcript recognition for their internship work. Like the 

summer. Internships provide valuable work experience, but are performed 

defines internships as flexible work experiences performed on part-

opportunities. The College of Engineering and Computer Science 

formal enrollment in the CECS Cooperative Education Program cannot be 

such cooperative-type 

In some instances students may be involved in a cooperative-type 

Registration in the Cooperative Education Program 

Each co-op work assignment extends for one term (four months) 

occupies the student full-time. From a group of co-op courses 

available, the co-op student, in consultation with the Director of the 

CECS Cooperative Education Program, elects a course whose content 

is appropriate to the level of practice being undertaken that term. Three 

such registrations are recommended (two are required) for satisfactory 

completion of the Cooperative Education Program. Since the co-op work 

assignment occupies the student full-time, enrollment in courses other 

than the co-op course is strongly discouraged. However, a student on 

a co-op assignment may register for a maximum of two other courses 

during the semester (the recommendation is no more than one course 

along with the co-op course).

In some instances students may be involved in a cooperative-type 

educational program prior to their eligibility for and/or acceptance into 

the Engineering Cooperative Education Program. Such cooperative-type 

programming might occur either while enrolled at UM-Dearborn or at 

another educational institution. However, employment completed prior 

to formal enrollment in the CECS Cooperative Education Program cannot be 

used for satisfying the requirements of the CECS Cooperative Education 

Program.

CECS Internship Program 

The Cooperative Education Office also provides students with internship 

opportunities. The College of Engineering and Computer Science 

defines internships as flexible work experiences performed on part-

time basis during the academic year and maybe full-time during the 

summer. Internships provide valuable work experience, but are performed 

without supervision of a university representative and students do 

not receive transcript recognition for their internship work. Like the 

Cooperative Education assignments, Engineering and Computer Science 

students are paid by their employers for internship assignments. Since 

internships are part-time employment, they do not require registration 

in a special internship course. Furthermore, students may enroll full-

time while on internship. However, students pursuing an internship are 

strongly recommended to discuss their overall workload (academic and 

employment) with an academic advisor in the Office of Advising and 

Academic Success.

CECS Experiential Honors Program 

The CECS Experiential Honors Program inspires the intellectual and 

leadership growth of students beyond academics. The program equips 

students with knowledge and skills that enhance their leadership and 

their preparedness to meet the challenges of their future engineering 

careers.

Program Features 

The Experiential Honors Program has two groups of elements: An 

Academic Element and Experiential and Leadership Elements. The 

Academic Element provides knowledge on design innovation and 

entrepreneurship. The Experiential and Leadership Elements focus 

on implementing academic knowledge in professional experience, 

engineering design, and/or engineering research.

Students will earn recognition for each element of the program 

by enrolling in a faculty supervised Experiential Honors course 

associated with the program element. Those who complete 1) the 

Academic Elements, 2) a faculty supervised internship (ENGR 399), 

3) an Experiential Honors Research project, and 4) an Experiential 

Honors Design project, will receive an Experiential Honors notation on 

their transcripts upon graduation. It is worth noting that all program 

requirements can be completed within the academic requirements of the 

student's degree program.

Who is eligible to participate? 

The program is open to all students at CECS who are in good academic 

standing and who are interested in extending their educational 

experience beyond the classroom. The program is open to freshmen and 

transfer students who have completed at least one semester of study on 

campus.

Students can join the program by completing an application form 

indicating their goals, their commitment to achieving these goals and 

their vision for incorporating the goals into their education. The program 

is open to all students and has no GPA requirement; however, to receive 

recognition, the students must accomplish the program elements and 

spend at least 4 full semesters of active participation.

How to Apply 

1. Attend an informational session about the program or meet with the 

   program director.

2. Identify a Faculty Advisor from your academic program who will guide 

   you and mentor you in the Experiential Honors program.

3. Submit the program application by the due date.

For more information, visit https://umdearborn.edu/cecs/undergraduate-

programs/https://umdearborn.edu/cecs/undergraduate-programs/)

Why Apply to the Program 

1. Work on experiential projects that bridge the gap between 

   engineering education and practice.

2. Develop leadership skills.

3. Receive recognition on your transcripts for participating in the 

   program.
Elements of the Program

- **Academic Elements:**
  - Complete at least one of the following courses (3 to 4 credit hours) that may also count as electives in your academic program:
    i. ENGR 360 (4 cr. hrs.): Design Innovation: Process, Method and Practice
    ii. ENT 400 (3 cr. hrs.): Introduction to Entrepreneurship
    iii. ENGR 400 (3 cr. hrs.): Applied Business Techniques for Engineers
  - Experiential and Leadership Elements:

Students are expected to enroll in a minimum of one credit hour (ENGR 399, ENGR 492 or ENGR 493) for each semester of active participation of the program. These count toward fulfilling the professional elective requirements of the student’s academic degree.

- Complete a semester long faculty supervised professional experience (ENGR 399, 1 cr. hr.)
- Complete 3 credit hours (1 cr. hr. per semester) in one or both of the following courses:
  a. Experiential Honors Directed Research Project (ENGR 492, 1 to 3 cr. hrs.)
  b. Complete Experiential Honors Directed Design Project (ENGR 493, 1 to 3 cr. hrs.)
- Selecting a topic of interest
- Identifying a faculty advisor to guide the project (if the topic is outside the expertise of your Experiential Honors Advisor).
- Presenting the outcome of your project at the end of the semester in which the project is completed.
- Submitting a project report that includes a reflection on the project and the lessons learned.

The honors design project may be an expansion of the scope of a senior design project. The credit hour for each activity is determined by the Faculty Advisor based on the effort required to complete the activity.

**Study Abroad Opportunities**

**Student Exchange Programs with the Jönköping School of Engineering in Jönköping, Sweden and the Ulm University of Applied Sciences in Ulm, Germany**

The College of Engineering and Computer Science offers two study abroad opportunities. Our exchange programs with Ulm University of Applied Sciences in Germany and Jönköping University in Sweden are a great way to gain intercultural experience while fulfilling degree requirements. Students register for a full-time course load and pay their normal UM-Dearborn tuition. All courses are taught in English and designed with exchange students in mind. To maintain full-time status and financial aid, students typically enroll in three technical courses and one language/culture course. Courses taken abroad count toward students’ UM-Dearborn GPA. Students register for courses at UM-Dearborn and pay their normal tuition. There is no extra fee to participate, but students should budget for living expenses, such as housing, food, airfare, and travel. All CECS majors in good academic standing are eligible to apply.

Please contact the Office of Advising and Academic Success to discuss these opportunities with your advisor, or visit the Office of International Affairs for information about additional study abroad programs.

**Career Opportunities**

A wide variety of employment opportunities is available to engineering and computer science graduates, as mentioned above. The University’s Office of Career Services offers numerous services to students and graduates in preparing for careers and in searching for professional employment in a chosen field.

**Student Organizations**

CECS students are involved in a wide variety of student organizations at UM-Dearborn. We have nearly two dozen clubs, teams, and professional organizations that will challenge students to problem solve, make connections, and prepare for a fulfilling career in engineering.

**Bioengineering**

Bioengineering is an emerging branch of engineering that primarily deals with problems of medicine, healthcare, and—in genera—quality of human life. It is a multidisciplinary field that combines scientific principles of biology, chemistry, physics, and mathematics with the best engineering techniques developed in traditional areas (for example, mechanical, electrical, chemical, and computer engineering) and new breakthrough methods developed in recent years.

Activities of bioengineers are widely spread. They use their knowledge to design and build medical instruments, artificial organs, prosthetic limbs, therapeutic devices, and medical imaging equipment. They help doctors to design new medical procedures, including new rehabilitation techniques. They also assist pharmaceutical and biotechnology industries in developing new, more efficient bioprocessing technologies. Finally, they find solutions for medical and biology-related problems of consumer technology in the areas of safety, ergonomics, and comfort.

Bioengineering is a rapidly growing profession with expanding career opportunities. By virtue of their vigorous cross-training, bioengineers are well-poised for careers in healthcare, medical device production, pharmaceutical industries, and consulting in health-related fields, as well as other positions in industry, education, and government.

**Undergraduate Degree Program**

The undergraduate program in bioengineering provides first a strong foundation in all of the basic ingredients of engineering: the natural and physical sciences, mathematics, a comprehensive socio-economic-cultural background, the behavioral sciences, and finally the basic engineering sciences that begin the development of problem-solving skills.

The program integrates natural sciences with engineering analysis and design concepts to advance the fundamental understanding of biological
systems and to develop biology-based technologies with applications across a wide spectrum of societal needs. The bioengineering curriculum is designed to cater to students looking to enter the professional world immediately after earning their undergraduate degree, as well as those who are interested in pursuing graduate studies and research. Various fundamental, design, and application oriented courses (e.g. Biomaterials, Biomechanics, Bioinstrumentation, Biotransport, and Bioprocesses) fulfill industrial needs and help students to perform well in biotech, pharmaceutical, and healthcare industries as engineering professionals. At the same time, the exposure to advanced courses and cross-cutting, state-of-the-art research experiences provide a solid foundation to continue graduate studies and emerge as leaders in science and engineering.

Bioengineering 4+1 Option

The accelerated undergraduate/master’s studies option in bioengineering (4+1 option) allows the most qualified UM-Dearborn undergraduate bioengineering students to pursue a program of study in which BSE and MSE degrees are earned in a five-year accelerated format. This is achieved via combining a portion of undergraduate and graduate coursework. Admitted 4+1 students can double-count up to 9 credits of 500-level or above bioengineering elective, core, or cognate courses taken during their junior or senior years. Of these, only one cognate course is allowed. In practice with the usual graduate student program rules, 4+1 students may also transfer a maximum of 6 additional 500 level credits toward the 30-credit master’s degree. These additional transfer credits can be taken during the junior and senior years and cannot be used for any portion of the undergraduate degree. Depending on the number of double-counted and transfer credits, 15-21 credits of graduate coursework would be needed to complete the master’s program after completion of the undergraduate degree.

Please see the Bioengineering 4+1 Option (https://umdearborn.edu/cecs/departments/mechanical-engineering/undergraduate-programs/41-bioengineering-program/) webpage for more information.

Program Educational Objectives

The Program Educational Objectives for the Bachelor of Science in Engineering in Bioengineering are:

- an ability to apply knowledge of mathematics, sciences and engineering.
- an ability to design and conduct experiments, as well as to analyze and interpret data.
- an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- an ability to function on multidisciplinary teams.
- an ability to identify, formulate and solve engineering problems.
- an understanding of professional and ethical responsibility.
- an ability to communicate effectively.
- the broad education necessary to understand the impact of engineering solutions in a global economic, environmental, and societal context.
- a recognition of the need for, and an ability to, engage in life-long learning.
- a knowledge of contemporary issues.
- an ability to use the techniques, skills and modern engineering tools which are necessary for engineering practice.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)
Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements

A candidate for the degree Bachelor of Science in Engineering (Bioengineering) is required to pursue scholastic quality and to complete satisfactorily the following program of study:

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a BSE degree in Bioengineering from UM-Dearborn.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Basic Preparation for Engineering</strong></td>
<td></td>
</tr>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (ECON 201 or 202 also fulfill 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 126</td>
<td>Engineering Computer Graphics</td>
<td>2</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134/144</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 136/146</td>
<td>General Chemistry IIA</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 103</td>
<td>Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td>4</td>
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<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td></td>
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<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td></td>
</tr>
<tr>
<td>ENGR 216</td>
<td>Computer Meth for Engineers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 250</td>
<td>Principles of Eng Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 230</td>
<td>Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>ME 265</td>
<td>Applied Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>ECE 305</td>
<td>Intro to Electrical Eng</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Professional Subjects and Program Electives</strong></td>
<td></td>
</tr>
<tr>
<td>BENG 325</td>
<td>Thermofluid for Bioengineering</td>
<td>4</td>
</tr>
<tr>
<td>BENG 351</td>
<td>Bio-Sensors &amp; Instrumentation</td>
<td>4</td>
</tr>
<tr>
<td>BENG 370</td>
<td>Biomechanics</td>
<td>4</td>
</tr>
<tr>
<td>BENG 364</td>
<td>Prob&amp;Stat in Bioengineering</td>
<td>3</td>
</tr>
<tr>
<td>BENG 375</td>
<td>Biomaterial Tissue Engrg</td>
<td>4</td>
</tr>
<tr>
<td>BENG 381</td>
<td>Bioprocessing</td>
<td>4</td>
</tr>
<tr>
<td>BENG 4671</td>
<td>Senior Design</td>
<td>4</td>
</tr>
<tr>
<td>BENG 325</td>
<td>Thermofluid for Bioengineering</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Upper-Level Tech Electives</strong></td>
<td></td>
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<tr>
<td>BCHM 370</td>
<td>Principles of Biochemistry</td>
<td></td>
</tr>
<tr>
<td>BENG 410</td>
<td>Bioinformatics</td>
<td></td>
</tr>
<tr>
<td>BENG 425</td>
<td>Transport in Biosystems</td>
<td></td>
</tr>
<tr>
<td>BENG 475</td>
<td>Regenerative Eng</td>
<td></td>
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<tr>
<td>BENG 492</td>
<td>Guided Study in Bioengineering</td>
<td></td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CHEM 227</td>
<td>Organic Chemistry Laboratory</td>
<td></td>
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<tr>
<td>CHEM 437</td>
<td>Nano-Biotechnology</td>
<td></td>
</tr>
<tr>
<td>ENGR 350</td>
<td>Nanoscience and Nanotechnology</td>
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</tr>
<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
<td></td>
</tr>
<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
<td></td>
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<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
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</tr>
<tr>
<td>IMSE 4675</td>
<td>Six Sigma &amp; Stat Proc Improv</td>
<td></td>
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<tr>
<td>IMSE 4425</td>
<td>Human Factors and Ergonomics</td>
<td></td>
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<tr>
<td>ME 3601</td>
<td>Des and Analy of Mach Elem</td>
<td></td>
</tr>
<tr>
<td>BENG 490</td>
<td>Directed Design Project</td>
<td></td>
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<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Bioengineering Design and Electives</strong></td>
<td></td>
</tr>
</tbody>
</table>
|        | Select 19 credits of Design or Upper-Level Tech Elective courses from lists below. At least one course must be a Design Course (3 or 4 credits) | 19
|        | **Design Electives**                                    |              |
|        | Select one Design Course:                              |              |

Students admitted to the 4+1 Option can double-count up to 9 credits of 500-level or above bioengineering elective, core, or cognate courses taken during their junior or senior years.

BENG 325  Thermofluid for Bioengineering  4 Credit Hours

This course is an introduction into mass and heat transport phenomena in biomedical systems. Basic mechanisms of fluid flow, heat transfer, and diffusion are presented and applied to biological objects (cells, tissues, organisms) and biomedical devices. Topics include mass, momentum, and energy conservation laws, physical properties of common and biological fluids, elements of fluid statics, control volume analysis, basics of fluid mechanics, conduction and convection heat transfer, diffusion, applications to hyper- and hypothermia, thermal ablation, and cryopreservation, basics of mass and heat transfer in the body.

**Prerequisite(s):** ENGR 216 and ME 230 and (ME 265 or ME 345)

**Restriction(s):** Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science
BENG 351 Bio-Sensors & Instrumentation 4 Credit Hours
The course covers measurements in biological materials using a variety of sensor technologies along with electronic instrumentation design and use. Safety and FDA requirements are also presented.
Prerequisite(s): (ME 265 or ME 345) and (MATH 216 or MATH 228) and BIOL 140 and ECE 305 and (ENGR 216 or ECE 270)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

BENG 364 Prob&Stat in Bioengineering 3 Credit Hours
Set theory, combinatorial analysis, probability and axioms, random variables, continuous and discrete distribution functions, expectations, Chebyshev's inequality, weak law of large numbers, central limit theorem, sampling statistics and distributions, point and interval estimation, and linear regression.
Prerequisite(s): MATH 116 or MATH 114 or Mathematics Placement with a score of 215
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

BENG 370 Biomechanics I 4 Credit Hours
The course provides a basic understanding of how the human body functions as a mechanical system. Review of mechanics. Musculoskeletal anatomy, statics and kinematics, muscle force redundancy, joint mechanics. Bone and soft tissue mechanics, muscle active force generation. Implant stress shielding and impact safety. Laboratory experiments directed at rehabilitation engineering, biological bone and tissue property measurement, bone and implant structural analysis, and implant safety.
Prerequisite(s): (ME 265 or ME 345) and (MATH 216 or MATH 228)
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

BENG 375 Biomaterial Tissue Engrg 4 Credit Hours
The course provides a basic understanding of the structure, properties and therapeutic applications of biomaterials, as well as the opportunities and scientific and technological challenges of tissue engineering. It also provides an integrated and multidisciplinary biological-engineering approach and probes mechanisms and methods of evaluation of tissue/biomaterials and patient/device interactions. Further the course assesses current outcomes, current challenges and cutting edge technological solutions to medical problems, Laboratory topics include key biological concepts, clinical safety, tissue culture, biological cells/ bioactive materials interaction, and scaffold testing.
Prerequisite(s): ENGR 250 and BIOL 140
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Level is Undergraduate
BENG 450  Biomedical Optics and Biophotonics  3 Credit Hours
Full Course Title: Biomedical Optics and Biophotonics The recent explosion of interest in minimally invasive medical diagnostics has been fueled in part by the development of novel optics and photonics techniques and instrumentation designed specifically for medical applications. A large number of optically-based imaging and sensing diagnostics are now in use in both the research laboratory and medical clinic. Topics include engineering design principles of optical instrumentation for medical diagnostics, elastic and inelastic light scattering theory and biomedical applications, confocal and multiphoton microscopy, light propagation and optical tomographic imaging in biological tissues, and design of minimally invasive spectroscopic diagnostics. (YR)
Prerequisite(s): PHYS 150 and PHYS 151
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if Major is Biomedical Engineering

BENG 451  Microfluidics  3 Credit Hours
Microelectromechanical systems (MEMS) have been developed for a wide range of applications from automotive to medical devices, and microfluidics extends these technologies to biological assays. Microfluidics and bioMEMS have a particular usefulness in biological applications due to their small volumes, low energy sensing, and minimal force actuators. Novel bioMEMS and microfluidics leverage techniques in biophysics, biochemistry, solid state devices, and polymer engineering to advance device developments.
Prerequisite(s): (BENG 325 or ME 325) and (BENG 375 or BENG 381)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 450  Nanobiosystems Engineering  3 Credit Hours
Nanobiosystems Engineering is an emerging frontier in nanotechnology. It integrates materials science, bioengineering, physics and life science with the biological and biochemical applications. This fast-developing interdisciplinary field holds the promise to solve many of the medical problems of future. The course will introduce advanced concepts related to nanomaterials and nanofabrication and their application in medicine. The course will also focus on design and development of nanodevices for the applications of pharmaceuticals and healthcare. Typical applications include nano-biosensor, targeted drug delivery, and tissue engineering will also be discussed. Students in Bioengineering will have a chance to present and discuss individual application through team project.
Prerequisite(s): (ME 325 or BENG 325) or (ME 349 or BENG 351 and BENG 375)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 4671  Senior Design  4 Credit Hours
A guided design project course where student teams propose design projects, design a device, system or process related to bioengineering and conduct evaluative experiments and/or construct a physical prototype. Engineering ethics and responsibility. At the end of the semester, the students are required to submit written reports and give oral presentations with a demonstration of their projects
Prerequisite(s): BENG 325 and BENG 351 and BENG 370 and (BENG 375 or BENG 381) and BENG 364
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Bioengineering

BENG 470  Advanced Biomechanics  3 Credit Hours
The course covers intermediate level subject matter on structural biomechanics, analysis and design. Topics include: soft tissue biomechanics, human motion analysis including gait, orthopedic implants, fixation and reconstruction, head impact and injury, advanced bone models. (YR)
Prerequisite(s): BENG 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

BENG 475  Regenerative Eng  3 Credit Hours
This course will discuss principles of tissue engineering whereby the properties of stem as well as primary cells, growth factors, and extracellular matrix and their impact in the development of engineered tissue constructs will be explored. In addition, the course will also focus on supporting/enabling technologies typically utilized in engineering these constructs including nano- and micro-fabrication techniques, 3D printing, micro-patterning as well as designing principles of bioreactors, and drug and gene delivery techniques. Additionally, various tissue engineering applications will be discussed including synthetic tissues and organs that are currently under development for regenerative medicine application.
Prerequisite(s): BENG 370 and BENG 375
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

BENG 481  Biomimetics  3 Credit Hours
The Biomimetic Engineering course will give an overview and in-depth analysis of nature's solutions to specific problems with the aim of determining appropriate engineering analogs. Students will learn mechanical principles in nature and their application to engineering devices. Mechanical behavior of biological materials as governed by underlying microstructure will be discussed. Students will work in teams on projects where they will take examples of designs, concepts and models from biology and determine their potential in specific engineering applications. 3 credit hours
Prerequisite(s): (ME 325 or BENG 325) and (BENG 370 or ME 345)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters
BENG 490  Directed Design Project  1 to 3 Credit Hours
Design project involving not only design but also analysis, fabrication, and/or testing. Topics may be chosen from any of the areas of bioengineering. The student will need to submit a report on his or her project at the end of the term. (F, S, W)

Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Bioengineering,

BENG 492  Guided Study in Bioengineering  1 to 3 Credit Hours
Individual study, design, or laboratory research in a field of interest to the student. Topics may be chosen from any areas of Bioengineering. The student needs to submit a report on his or her project at the end of the term. (F, S, W)

Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Bioengineering,

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

CIS Mathematics

Current CECS undergraduate students majoring in Computer and Information Science (CIS), Cybersecurity and Information Assurance (CIA), or Software Engineering (SE) may pursue a concurrent Bachelor of Science degree in CIS Mathematics. This makes it possible for CECS students to earn two degrees at the same time: a principal Bachelor of Science degree in CIS, CIA, or in SE and a separate concurrent Bachelor of Science degree in CIS Mathematics. Both degrees must be earned at the same time. The courses for the concurrent Bachelor of Science degree in CIS Mathematics cannot be used as elective credits for the principal degree, but must be taken in addition to the 120-123 credits required for the Bachelor of Science degree in CIS, the Bachelor of Science degree in CIA, or the Bachelor of Science degree in SE.

The educational objectives of the concurrent Bachelor of Science program in CIS Mathematics are to prepare graduates to:

1. Be able to develop innovative mathematical solutions to complex computational problems.
2. Engage in continuous learning to advance their professional careers.

Major Requirements

(Concurrent degree only)

The BS in CIS Mathematics degree requires a minimum of thirty credits in mathematics courses as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
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<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
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<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
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<tr>
<td>MATH 215</td>
<td>Calculus III</td>
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<tr>
<td>MATH 472</td>
<td>Intro to Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 395</td>
<td>Elementary Number Theory</td>
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<tr>
<td>Select a minimum of 8-9 credits from the following courses: 1, 4</td>
<td>8-9</td>
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<tr>
<td>MATH 315</td>
<td>Applied Combinatorics</td>
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<tr>
<td>MATH 372</td>
<td>Computing with Mathematica</td>
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</tr>
<tr>
<td>MATH 390</td>
<td>Topics in Mathematics (Prior approval by CECS for use in CIS Math degree needed)</td>
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</tr>
<tr>
<td>MATH 395</td>
<td>Elementary Number Theory</td>
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<tr>
<td>MATH 396</td>
<td>Introduction to Cryptography</td>
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<tr>
<td>MATH 404</td>
<td>Dynamical Systems</td>
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<tr>
<td>MATH 405</td>
<td>Integral Equations</td>
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<tr>
<td>MATH 412</td>
<td>First Course in Modern Algebra</td>
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<tr>
<td>MATH 413</td>
<td>Linear Algebra 2</td>
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<tr>
<td>MATH 420</td>
<td>Stochastic Processes</td>
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<tr>
<td>MATH 425</td>
<td>Mathematical Statistics</td>
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<tr>
<td>MATH 435</td>
<td>Mathematics of Finance</td>
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<tr>
<td>MATH 451</td>
<td>Advanced Calculus I</td>
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<tr>
<td>MATH 452</td>
<td>Advanced Calculus II</td>
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<tr>
<td>MATH 454</td>
<td>Fourier and Boundary</td>
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<tr>
<td>MATH 455</td>
<td>Func of a Complex Var with App 3</td>
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<tr>
<td>MATH 458</td>
<td>Introduction to Wavelets</td>
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<td>MATH 462</td>
<td>Mathematical Modeling</td>
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<td>MATH 472</td>
<td>Intro to Numerical Analysis</td>
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<td>MATH 473</td>
<td>Matrix Computation</td>
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<td>MATH 514</td>
<td>Fin Diff Meth for Diff Equat</td>
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<tr>
<td>MATH 515</td>
<td>B-Splines &amp; Their Applications</td>
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<tr>
<td>MATH 516</td>
<td>Fin Elemnt Meth for Diff Equat</td>
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<tr>
<td>MATH 523</td>
<td>Linear Algebra w/Applications</td>
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<td>MATH 582</td>
<td>Computer Algebra Systems</td>
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<tr>
<td>MATH 583</td>
<td>Discrete Optimization</td>
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<tr>
<td>MATH 584</td>
<td>Applied&amp;Algorithmic Graph Thy</td>
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<tr>
<td>MATH 590</td>
<td>Topics in Math &amp; Stat (Prior approval by CECS for use in CIS Math degree needed)</td>
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</tbody>
</table>

Total Credit Hours 30-31

1 8 credit hours can only be fulfilled by taking two 3-credit hour classes from the approved list and two credit hours of topics/independent study in mathematics
2 Credit for only one course from MATH 413, MATH 523
3 Credit for only one course from MATH 455, MATH 555.
4 Permission required to take a graduate course. Graduate tuition assessment applies.

The following CECS graduate courses may also be used towards the CIS Mathematics degree: CIS 451, CIS 551, CIS 552; ECE 555, ECE 560, ECE 567, ECE 580, IMSE 505, IMSE 510, IMSE 511; ME 518, ME 519, provided that:
1. a minimum of nine hours is taken from the Mathematics department (MATH) courses beyond the 15 credit hours required for the CIS degrees

2. permission to take a graduate course is granted.

Computer and Information Science

Computing professionals offer expertise in the effective and efficient use of computers for solving human problems, whether that be as a member of a project development team, as a builder of powerful and easy-to-use tools, as an individual researcher, or as an educator.

Required courses in the CIS major stress theory and application, as well as the role of other fields such as mathematics, statistics, electrical and computer engineering, business, and software engineering, among others. The curriculum is modeled on the recommendations of the two main professional computing societies, the Association of Computing Machinery (ACM) and the Institute for Electrical and Electronic Engineering (IEEE). Written and oral communications skills are emphasized throughout the program. The use of teamwork on projects is practiced in many courses. Professionalism and ethics are also stressed for future computing professionals. The CIS courses include software engineering, algorithm analysis, networking, security, programming languages, game design, computer architecture, data structures, operating systems, artificial intelligence, database management systems, graphics, information systems, robotics, web development and capstone design courses.

The CIS curricula prepare students to begin careers as computing professionals or to pursue graduate study in the field. The BS in Computer and Information Science program is accredited by the Computing Accreditation Commission of ABET, www.abet.org (http://www.abet.org/)

A candidate for the degree of BS in CIS is required to select one of two concentrations: Computer Science or Information Systems. A BS in Software Engineering is also offered. Both programs encourage innovation on the part of students, prepare students for graduate education, train students to communicate effectively, and provide students with the tools needed to become leaders in their profession.

The Computer Science concentration emphasizes understanding how computer systems work, as well as their uses as critical components in other disciplines, and prepares its graduates for positions in systems programming, scientific programming, networks, game programming, web technology, graphics and visualization, and enterprise computing among others.

The Information Systems concentration is oriented toward the design and development of computer information systems. It includes more business-related courses than the computer science concentration, and prepares graduates for positions in applications programming, database management, information systems design, and information engineering, among others.

Program Objectives

1. Our graduates will be successfully employed in computer science–related fields or other career paths, including industrial, academic, governmental, and non-governmental organizations, or will be successful graduate students in a program preparing them for such employment.

2. Our graduates will lead and participate in culturally diverse teams, becoming global collaborators.

3. Our graduates will continue their professional development by obtaining continuing education credits, professional registration or certifications, or post-graduate study credits or degrees.

Computer Science Program Outcomes

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline;

b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;

c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs;

d. An ability to function effectively on teams to accomplish a common goal;

e. An understanding of professional, ethical, legal, security, and social issues and responsibilities;

f. An ability to communicate effectively with a range of audiences;

g. An ability to analyze the local and global impact of computing on individuals, organizations, and society;

h. A recognition of the need for, and an ability to engage in, continuing professional development;

i. An ability to use current techniques, skills, and tools necessary for computing practices;

j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;

k. An ability to apply design and development principles in the construction of software systems of varying complexity;

l. An ability to program.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)
Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a B.S. degree in Computer and Information Science from UM-Dearborn.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CIS Core</td>
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<tr>
<td>CIS 150</td>
<td>Computer Science I</td>
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<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>4</td>
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<tr>
<td>CIS 310</td>
<td>Computer Org and Assembly Lang</td>
<td>4</td>
</tr>
<tr>
<td>CIS 350</td>
<td>Data Struct and Algorithm Anlys</td>
<td>4</td>
</tr>
<tr>
<td>CIS 375</td>
<td>Software Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 427</td>
<td>Comp Networks and Dis Process</td>
<td>4</td>
</tr>
<tr>
<td>CIS 450</td>
<td>Operating Systems</td>
<td>4</td>
</tr>
<tr>
<td>CIS 4951</td>
<td>Design Seminar I</td>
<td>2</td>
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<tr>
<td>CIS 4952</td>
<td>Design Seminar II</td>
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</table>

CIS students must choose a concentration in Computer Science, Information Systems or Game Design. Concentration requirements are listed below.

Computer Science Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four additional science credits; must be a different subject than the two course sequence prerequisite:</td>
<td></td>
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<tr>
<td>ASTR 130 &amp; ASTR 131</td>
<td>Introduction to Astronomy and Introductory Astronomy Lab</td>
<td>4</td>
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<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>3</td>
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<tr>
<td>BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
<td>4</td>
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<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
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<tr>
<td>CHEM 136</td>
<td>General Chemistry IIA</td>
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<tr>
<td>CHEM 144</td>
<td>Gen Chemistry IB</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 146</td>
<td>General Chemistry IIB</td>
<td>4</td>
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<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>4</td>
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<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
<td>4</td>
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<tr>
<td>CHEM 227</td>
<td>Organic Chemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 218</td>
<td>Historical Geology</td>
<td>4</td>
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<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
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</tr>
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<td>PHYS 126</td>
<td>Introductory Physics II</td>
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<td>PHYS 150</td>
<td>General Physics I</td>
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<td>PHYS 151</td>
<td>General Physics II</td>
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<td>CIS 306</td>
<td>Discrete Structures II</td>
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<tr>
<td>CIS 296</td>
<td>Java Programming</td>
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<tr>
<td>CIS 297</td>
<td>Intro to C Sharp</td>
<td>3</td>
</tr>
<tr>
<td>CIS 298</td>
<td>Intro to Python</td>
<td>3</td>
</tr>
<tr>
<td>CIS 405</td>
<td>Algorithm Analysis &amp; Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel</td>
<td>3</td>
</tr>
<tr>
<td>Two Courses (from below)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel (If CIS 479 also selected above, an additional Tech Elective is required)</td>
<td>6</td>
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<tr>
<td>ENGR 400</td>
<td>Appl Business Tech for Engr</td>
<td>4</td>
</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking &amp; Behavior</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 421</td>
<td>Eng Economy &amp; Dec Anlys</td>
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Technical Electives

Select from the following:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CIS 285</td>
<td>Software Engineering Tools</td>
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</table>
Information Systems Concentration Requirements

<table>
<thead>
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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
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<tr>
<td>CIS 376</td>
<td>Software Engineering II</td>
<td></td>
</tr>
<tr>
<td>CIS 381</td>
<td>Industrial Robots</td>
<td></td>
</tr>
<tr>
<td>CIS 387</td>
<td>Digital Forensics I</td>
<td></td>
</tr>
<tr>
<td>CIS 400</td>
<td>Programming Languages</td>
<td></td>
</tr>
<tr>
<td>CIS 405</td>
<td>Algorithm Analysis &amp; Design</td>
<td></td>
</tr>
<tr>
<td>CIS 411</td>
<td>Natural Language Processing</td>
<td></td>
</tr>
<tr>
<td>CIS 421</td>
<td>Database Mgmt Systems</td>
<td></td>
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<tr>
<td>CIS 423</td>
<td>Dec Support and Exp Systems</td>
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<tr>
<td>CIS 425</td>
<td>Information Systems</td>
<td></td>
</tr>
<tr>
<td>CIS 435</td>
<td>Web Technology</td>
<td></td>
</tr>
<tr>
<td>CIS 436</td>
<td>Mobile App Des &amp; Impl</td>
<td></td>
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<tr>
<td>CIS 437</td>
<td>Advanced Networking</td>
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<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
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<tr>
<td>CIS 449</td>
<td>Intro to Software Security</td>
<td></td>
</tr>
<tr>
<td>CIS 451</td>
<td>Computer Graphics</td>
<td></td>
</tr>
<tr>
<td>CIS 452</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td></td>
</tr>
<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
<td></td>
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<tr>
<td>CIS 474</td>
<td>Compiler Design</td>
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<tr>
<td>CIS 476</td>
<td>Soft Arch &amp; Design Patterns</td>
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<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel</td>
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<td>CIS 481</td>
<td>Computational Learning</td>
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<tr>
<td>CIS 487</td>
<td>Computer Game Design &amp; Implem</td>
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<td>CCM 472</td>
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<td>Matrix Computation</td>
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<td>ENGR 399</td>
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<td>ENGR 400</td>
<td>Appl Business Tech for Engr</td>
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<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
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<tr>
<td>ENGR 493</td>
<td>Exper Hrs Dir Dsgn</td>
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</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
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</table>

Technical Electives

Select 14 credit hours:

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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CIS 285</td>
<td>Software Engineering Tools</td>
<td></td>
</tr>
<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
<td></td>
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<tr>
<td>CIS 376</td>
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<td>CIS 381</td>
<td>Industrial Robots</td>
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<td>CIS 387</td>
<td>Digital Forensics I</td>
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<td>CIS 400</td>
<td>Programming Languages</td>
<td></td>
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<td>CIS 405</td>
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<td>CIS 435</td>
<td>Web Technology</td>
<td></td>
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<tr>
<td>CIS 436</td>
<td>Mobile App Des &amp; Impl</td>
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<tr>
<td>CIS 437</td>
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<td>Intro Computr &amp; Ntwrk Security</td>
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<td>Computer Graphics</td>
<td></td>
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<td>CIS 452</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td></td>
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<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
<td></td>
</tr>
<tr>
<td>CIS 474</td>
<td>Compiler Design</td>
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<td></td>
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<tr>
<td>CIS 481</td>
<td>Computational Learning</td>
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<tr>
<td>CIS 487</td>
<td>Computer Game Design &amp; Implem</td>
<td></td>
</tr>
<tr>
<td>CIS 488</td>
<td>Computer Game Design II</td>
<td></td>
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<tr>
<td>CCM 404</td>
<td>Dynamical Systems</td>
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<td>CCM 472</td>
<td>Intro to Numerical Analysis</td>
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<tr>
<td>CCM 473</td>
<td>Matrix Computation</td>
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<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
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<td>ENGR 400</td>
<td>Appl Business Tech for Engr</td>
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<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
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<tr>
<td>ENGR 493</td>
<td>Exper Hrs Dir Dsgn</td>
<td></td>
</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
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</table>

General Electives

Any 100 to 400 level course with no more than 6 credits, as needed to get a minimum of 120 credits for graduation.

Game Design Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
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<tr>
<td>IMSE 3005</td>
<td>Intro to Operations Research</td>
<td>4</td>
</tr>
<tr>
<td>CIS 296</td>
<td>Java Programming</td>
<td>3</td>
</tr>
<tr>
<td>or CIS 297</td>
<td>Intro to C Sharp</td>
<td>3</td>
</tr>
<tr>
<td>or CIS 298</td>
<td>Intro to Python</td>
<td>3</td>
</tr>
<tr>
<td>CIS 421</td>
<td>Database Mgmt Systems</td>
<td>4</td>
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<tr>
<td>CIS 425</td>
<td>Information Systems</td>
<td>4</td>
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<tr>
<td>CIS 476</td>
<td>Soft Arch &amp; Design Patterns</td>
<td>3</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>3</td>
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<tr>
<td>Two Courses (From below)</td>
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<td>6</td>
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<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel</td>
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<tr>
<td>ENGR 400</td>
<td>Appl Business Tech for Engr</td>
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</table>

Natural Science

Four additional science credits; must be a different subject than the two course sequence prerequisite. 4

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ASTR 130</td>
<td>Introduction to Astronomy</td>
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<tr>
<td>ASTR 131</td>
<td>and Introductory Astronomy Lab</td>
<td></td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
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<tr>
<td>BIOL 140</td>
<td>Intro Molec &amp; Cellular Biology</td>
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<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
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<tr>
<td>CHEM 144</td>
<td>Gen Chemistry IB</td>
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<tr>
<td>CHEM 136</td>
<td>General Chemistry IIA</td>
<td></td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 226</td>
<td>Organic Chemistry II</td>
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</table>
### Minor in Computer and Information Science

The minor in CIS requires a minimum of 24 credit hours, which must include CIS 150, CIS 200, CIS 275, CIS 350 and eight additional credit hours at the 300 or 400 level approved by the student's faculty advisor in CIS. An introduction to calculus (MATH 115) is required and does not count toward the 24 hours. Completion of MATH 116 is strongly recommended.

**CIS 112 Computer Literacy/Info Mgmt** 3 Credit Hours
This is a microcomputer literacy course with primary emphasis on the application tools of the word processor, spreadsheets, and database. Additional topics of computer terms, systems, and use in society are included. The course is intended for undergraduates in the College of Arts, Sciences, and Letters. No previous experience with computers is expected. (YR).

**CIS 125 Survey of Computer Science** 3 Credit Hours
A survey of computer science topics, including history of computing, office productivity software, the internet, HTML, JavaScript, web design, algorithms, assemblers and compilers, gates and logic design, models of computation, artificial intelligence and expert systems, computing ethics, privacy issues, intellectual property. No credit for CIS majors. (F,W,S).

**CIS 150 Computer Science I** 4 Credit Hours
This course provides a foundation for further studies in computer and information science and emphasizes a structured approach to problem solving and algorithm development. Topics include principles of program design, coding, debugging, testing, and documentation. Students are introduced to the Unified Modeling Language for requirements analysis using use-cases and activity diagrams, an object oriented programming language, and the fundamentals of computer hardware, system software, and components. The course will consist of three lecture hours and one two-hour laboratory.

**Prerequisite(s):** MATH 115* or MATH 113* or Mathematics Placement with a score of 116

**Corequisite(s):** CIS 150L

**CIS 1501 CS I for Data Scientists** 4 Credit Hours
This course provides a foundation for further studies in computer and information science and emphasizes a structured approach to problem solving and algorithm development using a high-level language more suited to data science applications. Topics include principles of program design, coding, debugging, testing, and documentation. Students are introduced to the Unified Modeling Language for requirements analysis using use-cases and activity diagrams, an object-oriented programming language for data science applications, and the fundamentals of computer hardware, system software, and components. The course will consist of three lecture hours and one two-hour laboratory. The labs will cover various data science applications. (F,W,S)

**Prerequisite(s):** MATH 115* or MATH 113* or Mathematics Placement with a score of 116

**Corequisite(s):** CIS 150L

**CIS 200 Computer Science II** 4 Credit Hours
This course presents techniques for the design, writing, testing, and debugging of medium-sized programs, and an introduction to data structures (stacks, queues, linked lists) using an object-orientated programming language. Topics covered include pointers, templates, and inheritance. The principles of UML modeling are continued. This course will consist of three lecture hours and one two-hour laboratory.

**Prerequisite(s):** (MATH 115 or Mathematics Placement with a score of 116) and (CIS 150 or IMSE 150 or CCM 150)

**Corequisite(s):** CIS 200L

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CIS 275</td>
<td>Applied Business Tech for Engr</td>
<td>12</td>
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<tr>
<td>ENGR 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 421</td>
<td>Eng Economy and Dec Anlys</td>
<td>3</td>
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<td>Technical Electives</td>
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<tr>
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<tr>
<td>CIS 285</td>
<td>Software Engineering Tools</td>
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<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
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<td>CIS 376</td>
<td>Software Engineering II</td>
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<td>CIS 381</td>
<td>Industrial Robots</td>
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<td>CIS 387</td>
<td>Digital Forensics I</td>
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<tr>
<td>CIS 405</td>
<td>Algorithm Analysis &amp; Design</td>
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<td>CIS 411</td>
<td>Natural Language Processing</td>
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<tr>
<td>CIS 449</td>
<td>Intro to Software Security</td>
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<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
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<tr>
<td>CIS 474</td>
<td>Compiler Design</td>
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<tr>
<td>CIS 476</td>
<td>Soft Arch &amp; Design Patterns</td>
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<tr>
<td>CIS 481</td>
<td>Computational Learning</td>
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<tr>
<td>CCM 472</td>
<td>Intro to Numerical Analysis</td>
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<tr>
<td>CCM 473</td>
<td>Matrix Computation</td>
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<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
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<td>ENGR 400</td>
<td>Appl Business Tech for Engr</td>
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<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
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<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
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<td>General Electives</td>
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<tr>
<td>Any 100 to 400 level course with no more than 6 credits, as needed to get a minimum of 120 credits for graduation.</td>
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</tbody>
</table>
CIS 201  CS II for Data Scientists  4 Credit Hours
This course presents techniques for the design, writing, testing, and debugging of medium-sized programs, and an introduction to data structures (stacks, queues, linked lists) using an object-oriented programming language for data science applications. Topics covered include pointers, templates, and inheritance. The principles of UML modeling are continued. This course will consist of three lecture hours and one two-hour laboratory. The labs will cover various data science applications. (F, W, S)
Prerequisite(s): CIS 1501 and MATH 115 or MATH 113 or Mathematics Placement with a score of 116

CIS 205  Comp Programming for Engineers  3 Credit Hours
Full Course Title: Computer Programming for Engineers- Intermediate topics in computer programming: arrays, files, structured data types, pointers, functions. Overview of digital computer hardware and system software components: machine architecture, operating systems, computer networks, data security, and performance evaluation. No credit for CIS majors.
Prerequisite(s): ENGR 100 or (MATH 105 or Mathematics Placement with a score of 113)

CIS 275  Discrete Structures I  4 Credit Hours
This course introduces students to various topics in discrete mathematics, such as set theory, mathematical logic, trees, and graph theory. Applications to relational databases, modeling reactive systems and program verification are also discussed. (FWS)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of 116) and CIS 200*

CIS 285  Software Engineering Tools  3 Credit Hours
This course will cover various CASE tools, such as UML modeling and code generation tools, configuration management tools, defect management tools, an integrated development environment for coding and debugging, unit and testing tools, and build tools. Students will learn these tools in a laboratory environment. This course will be comprised of one lecture hour and one two-hour laboratory. (FW)
Prerequisite(s): CIS 200*

CIS 290  Topic in Programming Languages  2 Credit Hours
One significant programming language is covered in depth. The particular language changes from term to term. The language chosen might be Ada, C, MODULA 2, USP, PROLOG, or SMALLTALK.
Prerequisite(s): CIS 200

CIS 294  Programming with Visual Basic  3 Credit Hours
An introduction to create professional-looking applications using the graphical user interface of Windows. Students learn how to create graphical objects and controls, write event driven code that responds to clicking on buttons, work with multiple forms and executable files. (FS).
Prerequisite(s): CIS 200 or IMSE 200

CIS 296  Java Programming  3 Credit Hours
Course covers Java Programming language, focusing on GUI development, distributed computing and network applications.
Prerequisite(s): CIS 200 or CIS 2001

CIS 297  Intro to C Sharp  3 Credit Hours
This course provides an introduction to the C# programming language and the .NET Framework for the development of Windows game applications. Some discussion of DirectX programming and Xbox game development is also included. (W)
Prerequisite(s): CIS 200 or CIS 2001

CIS 298  Intro to Python  3 Credit Hours
Full Title: Introduction to Python An introduction to the Python programming language and its various libraries, packages, and toolkits. The focus of this course will be on the development of analytics/data science applications. (W)
Prerequisite(s): CIS 200 or IMSE 200
Restriction(s):
Can enroll if Level is Undergraduate

CIS 299  Internship  1 Credit Hour
Student works with an industrial sponsor in the area of CIS. Approval of Internship Coordinator required. (FWS).

CIS 306  Discrete Structures II  4 Credit Hours
This course introduces students to further topics in discrete mathematics, including theory of computation, more complexity theory, coding theory, and game theory.
Prerequisite(s): CIS 275

CIS 310  Computer Org and Assembly Lang  4 Credit Hours
The architecture of computer systems and associated software. Topics include digital logic circuits, computer interfacing, interrupt systems, input/output systems, memory systems, assemblers and assembly language programming, and computer networks. (FWS).
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of 116) and (CIS 200 or IMSE 200) and CIS 275

CIS 316  Prac. Comp. Sec.  3 Credit Hours
Full Title: Practical Aspects of Computer Security This course provides a practical introduction to a broad range of security topics including legal, ethical and professional issues in information security. Covered topics include: practical computer security principles; firewalls, malware, and intrusion detection; cryptography basics and its applications; mobile devices and related security issues; network technologies and their vulnerabilities. (YR)
Prerequisite(s): CIS 200
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 3200  Data Science II  4 Credit Hours
This course provides an overview of what Big Data is and explores its characteristics. It introduces the fundamental technologies, platforms, and methods that enable Big Data analysis, and covers how to acquire, store, and analyze very large amounts of information to complete Big Data analysis tasks. Topics include MapReduce, similarity search, mining real-time data streams, link analysis, clustering, recommender systems, social network graph mining, and large scale data mining tasks. (W)
Prerequisite(s): (CIS 2001 or CIS 200) and ECE 3100

CIS 350  Data Struc and Algorithm Anlys  4 Credit Hours
This course focuses on data design and algorithm design. Data design topics include object-oriented discussions of hashing, advanced tree structures, graphs, and sets. Algorithm design topics include the greedy, divide-and-conquer, dynamic programming, backtracking and branch-and-bound techniques. A significant discussion of algorithm complexity theory, including time and space trade-offs and elementary computability theory, is included. (FWS)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of 116) and (CIS 200 or IMSE 200) and CIS 275
CIS 3501  Data Struct & Alg Anlys for SE  4 Credit Hours
This course focuses on data design and algorithm design for software engineers. Data design topics include object-oriented discussions of hashing, advanced tree structures, graphs and sets. Algorithm design topics include the greedy, divide-and-conquer, dynamic programming, backtracking and branch-and-bound techniques. A significant discussion of algorithm complexity theory, including time and space trade-offs and elementary computability theory, is included. (F,W,S)
Prerequisite(s): (MATH 115 or Mathematics Placement with a score of 116) and (CIS 200 or IMSE 200) and CIS 275

CIS 375  Software Engineering I  4 Credit Hours
This course presents an in-depth treatment of the following software engineering topics: software engineering paradigms, requirements, specification, functional design, object-oriented design, user interface design, software verification and validation, and the maintenance and management of software engineering artifacts, as well as an introductory discussion of software reliability. Various phases of the software engineering process will be modeled using UML. (F,W,S)
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40)

CIS 376  Software Engineering II  4 Credit Hours
This course continues the formal development of the software engineering material begun in CIS 375. Topics covered include personal software process, team software process, formal methods, security, software architecture, software quality assurance, software fault tolerance, the evaluation of the effectiveness of human computer interaction and software reliability. (W,S)
Prerequisite(s): CIS 375

CIS 381  Industrial Robots  4 Credit Hours
The course introduces students in engineering and computer science to fundamentals of robotics technology, programming and their applications in industrial environment. The emphasis will be on robotics anatomy and configurations, robotics kinematics, end effectors, use of sensors in robotics, robotics programming, design of robot workcell, robotics applications to production problems, cost justifications and robotic safety, rather than on the extensive theory of robotics. Three-hour lecture and three-hour laboratory per week.
Prerequisite(s): MATH 115
Restriction(s):
Can enroll if Class is Junior or Senior

CIS 387  Digital Forensics I  4 Credit Hours
This course takes a detailed, hands-on approach to study the procedures and techniques used to identify, extract, validate, document and preserve electronic evidence. Students completing this course will be familiar with the core computer science theory and practical skills necessary to perform basic computer forensic investigations, understand the role of technology in investigating computer-based crime, and be prepared to deal with investigative bodies at a basic level.
Prerequisite(s): (CIS 200 or ECE 270) and (CIS 310* or ECE 370* or ECE 372*)
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate

CIS 390  Topics in Computer Science  1 to 3 Credit Hours
A course designed to offer selected topics in an area of computer science. The specific topics will be announced (together with special prerequisites) each time offered. Students must elect different topics to take both CIS 390 and CIS 391. (OC).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and ECE 276) or (ECE 370 and MATH 276)

CIS 391  Topics in Computer Science II  1 to 3 Credit Hours
A course designed to offer selected topics in an area of computer science. The specific topics will be announced (together with special prerequisites) each time offered. Students must elect different topics to take both CIS 390 and CIS 391. (OC).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and ECE 276) or (ECE 370 and MATH 276)

CIS 399  Internship  1 Credit Hour
Student works with industrial sponsor in the area of CIS. Permission of Internship Coordinator required. (F,W,S)

CIS 400  Programming Languages  4 Credit Hours
Systematic study of programming languages with regard to their implementation, structures, and use. Languages are compared with regard to their various data types, data structures, operations, control structures, programming environments, and ease of use in solving various programming problems. (F,W,S)
Prerequisite(s): (CIS 350 or IMSE 350 or CIS 3501) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276)

CIS 405  Algorithm Analysis & Design  3 Credit Hours
This course investigates how to design efficient algorithms. Topics include asymptotic analysis, amortized analysis, divide-and-conquer, dynamic programming, greedy algorithms, branch and bound, backtracking, lower bounds, NP-completeness and approximation algorithms.
Prerequisite(s): CIS 350

CIS 411  Natural Language Processing  3 Credit Hours
This course provides an introduction to the theory and practice of natural language processing (NLP), as well as the approaches that allow understanding, generating, and analyzing natural language. The course will cover the three major areas in NLP: syntax, semantics, and pragmatics. The course will introduce both knowledge-based and statistical approaches to NLP. Illustrate the use of NLP techniques and tools in a variety of application areas, and provide insight into many open research problems. (YR)
Prerequisite(s): CIS 350 or CIS 3501

CIS 421  Database Mgmt Systems  4 Credit Hours
An introduction to database systems, concepts, and techniques. Topics covered include: database environments, ER modeling, relational data model, object-oriented databases, database design theory and methodology, database languages, query processing and optimization, concurrency control, database recovery, and database security.
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 351 or (ECE 370 and MATH 276)
CIS 422  Massive Data Management  4 Credit Hours
An introduction to database systems, concepts, and techniques for big data. The course discusses classical relational technologies, and then covers the more current approaches to managing massive amounts of data for analytics purposes. Topics include database environments, database design, the relational data model, normalization, SQL, query processing, parallel databases and query processing, in-database analytics, data warehousing, key-value and column stores, NoSQL and NewSQL approaches for managing massive data. (F)
Prerequisite(s): (CIS 2001 or CIS 200) and CIS 3200

CIS 423  Dec Support and Exp Systems  3 Credit Hours
The application of artificial intelligence to building decision support and expert systems for management and other applications. Topics include fundamentals of artificial intelligence, knowledge representation and knowledge processing, tools for building expert systems (logic programming, expert shells), decision support system design (modeling and simulation), expert system design (knowledge engineering, learning). (F).
Prerequisite(s): CIS 421

CIS 425  Information Systems  4 Credit Hours
This course provides in-depth coverage of advanced infrastructures for the development of next-generation information systems. Topics include information systems, data integration, XML, web services, ontologies, workflow, data warehousing, and data mining.
Prerequisite(s): CIS 375 and (CIS 421* or CIS 422*)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore

CIS 427  Comp Networks and Dis Process  4 Credit Hours
Study of the management aspects of computing networks and distributed systems. Topics include network architectures (ISO/OSI, TCP/IP/ATM), communication hardware (transmission media, network adaptors, switches), encoding, framing, error detection and correction, reliable transmission, data link control and LAN technology, internetworking, routing/congestion control, network design/management.
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 351) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317

CIS 435  Web Technology  3 Credit Hours
This course deals with the study of technologies used to design and implement multimedia web sites. Topics include web servers, HTML, CGI, scripting languages, Java applets, back-end database connectivity, web security, multimedia, XML. (FW).
Prerequisite(s): CIS 375* or CIS 553*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Cannot enroll if Major is

CIS 436  Mobile App Des & Impl  3 Credit Hours
This course introduces students to the development of software applications for programmable mobile and wireless intelligent handheld devices. Topics covered include the different mobile development platforms, best practices in mobile user interaction design, software quality assurance in mobile environment, security and privacy issues, and context-aware computing. Students will participate in a final project.
Prerequisite(s): CIS 375*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

CIS 437  Advanced Networking  3 Credit Hours
Topics include an overview of the internet, congestion control, quality of service, internet multicasting, multimedia networking, mobile and wireless networks, vehicular networks, overlay networks, peer-to-peer networks, internet management (SNMP), and internet applications (web, HTTP and email-SMTP).
Prerequisite(s): CIS 427
Restriction(s):
Cannot enroll if College is Business

CIS 446  Wireless & Mobi Comp Security  3 Credit Hours
Full course title: Wireless and Mobile Computing Security. The course focuses on security and privacy issues in the area of wireless networks and mobile computing such as cellular networks, wireless LANs, connected vehicles, smart and mobile devices, sensors and sensor networks, IoT, etc. The course will first present on overview of wireless communication and wireless systems, then focus on attacks, discuss proposed solutions and their limitations. Topics of this course include: (1) introduction to security primitives and wireless networks; (2) security issues in single-hop wireless networks that include cellular networks, RFID, mobile vehicle, smartphone security; (3) security issues in multi-hop wireless network that include Mobile Ad Hoc network, wireless sensor network and vehicular network security. (YR)
Prerequisite(s): (CIS 200 or CIS 2001) and MATH 396

CIS 447  Intro Computr & Ntwrk Security  3 Credit Hours
This course will provide a broad-spectrum introduction to the fundamental principles of computer and network security. Topic will include security policies, models and mechanisms for confidentiality, integrity and availability, access control, authorization, cryptography and applications, threats and vulnerabilities in computer networks, key management, firewalls and security services in computer networks.
Prerequisite(s): CIS 450*
Restriction(s):
Cannot enroll if College is Education, Health, and Human Services or Business

CIS 449  Intro to Software Security  3 Credit Hours
This course provides a broad-spectrum introduction to the fundamental principles of software security, as well as the approaches that allow understanding common software practices, analyzing programs for vulnerabilities, and methods for developing secure software systems. The course will cover three major areas: software attacks and defenses, program analysis, and software verification. Various forms of software will be considered in this class including high level applications and system software. The course will also provide insight into many open research problems in this area. (YR)
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and ECE 276) or (ECE 370 and MATH 276)

CIS 450  Operating Systems  3 or 4 Credit Hours
Introduction to computer operating systems. Process control, threads, concurrency, memory management, virtual memory, uniprocessor, multiprocessor, and real-time scheduling, I/O management, disk scheduling, file management, distributed processing, client/server, clusters, distributed process management, security. (FW).
Prerequisite(s): CIS 310 and (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317*
CIS 451  Computer Graphics  3 Credit Hours
Basic geometrical concepts: graphics output primitives, two-dimensional transformations, windowing and clipping, three-dimensional viewing, visible surface detection methods, and graphical user interfaces. (F).
Prerequisite(s): (MATH 217 or MATH 227 or MATH 228) and (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 370 and ECE 276)

CIS 452  Inf Vis & Multimedia Gaming  3 Credit Hours
This course introduces basic techniques for digital animation, computer and video games, and web multimedia. Topics include the process of creating animated video clips from start to finish, including story creation, storyboarding, modeling, animation, and post-production; several key techniques for video editing and motion generation, including keyframe, motion capture editing, collision detection, particle systems, physical simulation, and real-time rendering; techniques for web animation and multimedia; and internet gaming.
Prerequisite(s): CIS 451 or CIS 487
Restriction(s):
- Cannot enroll if Class is Senior
- Cannot enroll if College is Education, Health, and Human Services or Business

CIS 467  Digital Forensics II  4 Credit Hours
This course is a continuation of Digital Forensics I and will focus on Internet Forensics. Students will examine in-depth concepts in Internet evidence collection and preservation, as well as applications of contemporary commercial forensic investigative software.
Prerequisite(s): (CIS 427* or ECE 471*) and (CIS 387 or ECE 387)
Restriction(s):
- Cannot enroll if Class is Freshman
- Cannot enroll if College is Business

CIS 474  Compiler Design  3 Credit Hours
Principles of language compilation. Introduction to formal languages. Lexical analysis, top-down and bottom-up parsing, code generation and optimization. Error handling and symbol table management. Run-time storage management. Programming language design. Introduction to compiler-writing tools such as LEX and YACC. (FW).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276)

CIS 476  Soft Arch & Design Patterns  3 Credit Hours
This course focuses on design patterns in object-oriented programming. This course begins with an overview of UML and a review of object-oriented programming and then moves on to various structural, behavioral and creational patterns, including: facades, adaptors, bridges, factories and the template method. Analysis of case studies will also be discussed. Using various modern software tools, students will apply various design patterns to real-world software design problems to gain complete practical understanding. (FW)
Prerequisite(s): CIS 375
Restriction(s):
- Cannot enroll if College is Business

CIS 479  Intro to Artificial Intel  3 Credit Hours
This course introduces students to basic concepts and methods of artificial intelligence from a computer science perspective. Emphasis of the course will be on the selection of data representations and algorithms useful in the design and implementation of intelligent systems. The course will contain an overview of one AI language and some discussion of important applications of artificial intelligence methodology. (S).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276) or (ECE 370 and ECE 276)

CIS 481  Computational Learning  3 Credit Hours
This course covers basic computational aspects of learning to perform a task and improve with experience. Topics include learning frameworks and problem formulations; standard models, methods, computational tools, algorithms and modern techniques; and methodologies to evaluate learning ability and to automatically select optimal models. The main focus is on computer science (e.g., basic runtime, space and complexity analysis, programming, and empirical evaluations?). Simple applications to areas such as computer vision, natural language processing (NLP), and robotics will also motivate the course material. (W)
Prerequisite(s): CIS 306 and (MATH 217* or MATH 227*) and (IMSE 317* or BENG 364* or MATH 425*)
Restriction(s):
- Cannot enroll if Class is Graduate or Doctorate

CIS 4851  Data Security and Privacy  3 Credit Hours
This course covers basics of data security and privacy techniques, which can facilitate the use of data in a secure and privacy-sensitive way. Topics include security and privacy challenges due to data collection and analytics, technologies and strategies for data security and privacy (access control mechanism, integrity policy, cryptography and encryption, notice and consent, anonymization or de-identification, deletion and non-retention). (W)
Prerequisite(s): CIS 200 or CIS 2001

CIS 487  Computer Game Design & Implem  3 Credit Hours
This course deals with the study of the technology, science and art in the creation of computer games. The focus of the course will be hands-on development of computer games. Students will study a variety of software technologies relevant to computer game design, including programming languages, scripting languages, operating systems, file systems, networks, simulation engines and multi-media design systems. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, real-time processing, game theory, software engineering, human computer interaction, graphic design and game aesthetics. (F).
Prerequisite(s): CIS 375*
Restriction(s):
- Cannot enroll if Class is Junior or Senior
- Cannot enroll if Major is

CIS 488  Computer Game Design II  3 Credit Hours
This course is a continuation of the material studied in CIS 487. The focus of the course will be hands-on development of computer game development tools (e.g. game engines). Students will study a variety of software technologies relevant to computer game design, including: 3D graphics, computer animation, data-driven game design, multiplayer game programming, and game AI. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, game theory, software engineering, human computer interaction and game content development. (W)
Prerequisite(s): CIS 487
Restriction(s):
- Cannot enroll if Class is Junior or Senior
- Cannot enroll if College is Engineering and Computer Science

CIS 490  Advanced Topics  1 to 3 Credit Hours
This course is intended for seniors and graduate-level students in CIS. For specific topic, consult current semester’s Schedule of Classes. (OC).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 270 and ECE 276) or (ECE 370 and MATH 276)
CIS 491  Research Project I  1 to 4 Credit Hours
Provides the advanced student with the opportunity to undertake a research project under the supervision of a faculty member. At least two weeks prior to registration in the semester when such a course is to be elected, an interested student must submit to the CIS chair and one CIS faculty member a written request for permission to elect a research course on the appropriate form available in the CIS Office. The request will include a description of the proposed research project. The CIS chair will review the proposal with faculty members to ascertain availability of relevant faculty supervision and to establish appropriate credit. Grades will be granted on a Pass/Fail (S/E) basis exclusively. (F,W,S).
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is CIS/Information Systems

CIS 492  Research Project II  1 to 4 Credit Hours
This course is a second registration for a research project in CIS. (F,W,S).
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is CIS/Information Systems

CIS 493  Independent Study I  1 to 4 Credit Hours
Readings or analytical assignments in accordance with the needs and interests of those enrolled and agreed upon by the student and an instructor, which shall not duplicate a formal course offering. Permission of instructor required. (F,W,S).

CIS 494  Independent Study II  1 to 4 Credit Hours
This course is a second registration for an independent study in CIS. Permission of instructor required. (F,W,S).

CIS 4951  Design Seminar I  2 Credit Hours
Students participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice. (F,W,S)
Prerequisite(s): CIS 375 and CIS 310 and (CIS 427 or CIS 450)
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 4952  Design Seminar II  2 Credit Hours
Students continue to participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice. (F,W,S)
Prerequisite(s): CIS 4951
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 4961  Design Seminar for SE I  2 Credit Hours
Software engineering students participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice in software engineering. (F,W,S)
Prerequisite(s): CIS 376
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Engineering and Computer Science

CIS 4962  Design Seminar for SE II  2 Credit Hours
Software engineering students continue to participate in the design and implementation of a major software project. Seminar topics discussed include: computing ethics and professional practice in software engineering.
Prerequisite(s): CIS 4961 and CIS 476*
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 4971  Cap Sem for Data Sci I  2 Credit Hours
Data science students participate in the design and implementation of a major data science project. Seminar topics discussed include: computing ethics and professional practice in data science. (F, W, S)
Prerequisite(s): CIS 3200 and (STAT 325 or IMSE 317)
Restriction(s):
Can enroll if Class is Senior

CIS 4972  Cap Proj for Data Sci II  2 Credit Hours
Data science students continue to participate in the design and implementation of a major data science project. Seminar topics discussed include: computing ethics and professional practice in data science. (F, W, S)
Prerequisite(s): CIS 4971 and STAT 430*
Restriction(s):
Can enroll if Class is Senior

CIS 4981  Design Seminar for CIS-DS I  2 Credit Hours
Full Course Title: Design Seminar for Dual Degree CIS-DS Majors I Dual degree CIS and Data Science students participate in the design and implementation of a major software project involving data science. Seminar topics discussed include computing ethics and professional practice in data science. (F,W,S)
Prerequisite(s): CIS 375 and CIS 3200 and (STAT 325 or IMSE 317) and CIS 310 and (CIS 427 or CIS 450)
Restriction(s):
Can enroll if Class is Senior

CIS 4982  Design Seminar for CIS-DS II  2 Credit Hours
Dual Degree CIS and Data Science students participate in the design and implementation of a major software project involving data science. Seminar topics discussed include computing ethics and professional practice in data science. (F,W,S)
Prerequisite(s): CIS 4981 and STAT 430*
Restriction(s):
Can enroll if Class is Senior

CIS 499  Internship  1 Credit Hour
Student works with industrial sponsor in area of CIS. Approval of Internship Coordinator required. (F,W,S).

An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Computer Engineering

Computers and digital technology have dramatically altered many facets of life including entertainment, manufacturing, transportation, public safety and power production. Computer Engineers have many career opportunities in these areas that will only become more important and prevalent in the future. Most of the modern electronic devices and appliances available today contain advanced computer technology. Video game consoles, for example, utilize very powerful special-purpose computers that receive user input (from the joystick or controller), perform computations to control the game and display high-resolution graphics and sound in real time. Such devices require specialized digital circuits that can process massive amounts of data very efficiently. Computer engineers use their specialized knowledge to design a variety of systems that integrate how the hardware (electronic circuits
and processors) interacts with the software such as C++ or Java to control the system and process inputs from the user. This type of close interaction between hardware and software is essential for many important applications, such as automotive systems, web and GPS-enabled devices, wireless communication, military applications, and medical imaging.

The Bachelor of Science Engineering in Computer Engineering at UM-Dearborn was developed to meet the increasing demand for engineers with knowledge of both hardware design and software development. The program offers a 125-hour curriculum consisting of core courses and technical electives. In addition to in-depth courses in engineering fundamentals, theory, and design principles, students get hands-on experience with the latest hardware and software, such as microprocessor and DSP-based development boards, system-on-a-chip technology, computer networks, and reconfigurable computing. In the junior year, students learn how to design and implement an instruction set and logic functions for a computer. In the senior year, students work on projects in which they design a complete real-world system, from initial specifications to final design, testing, and documentation. Students with an interest in pursuing graduate studies or wish to pursue a research and development career are encouraged to undertake directed research projects under the supervision of faculty advisors for more advanced design experiences.

A unique feature of the Computer Engineering program is the opportunity for students to work concurrently to earn a second degree in Electrical Engineering by taking an additional 16 credit hours of courses. In this case, a student can earn two Bachelor’s Degrees in just 141 credit hours. Since some job listings require a computer engineering background while others require specialization in electrical engineering, a student who pursues the dual degree option is qualified for a much wider variety of engineering positions.

The Bachelor of Science Engineering in Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org (http://www.abet.org/)

Program Educational Objectives

The graduates who receive the Bachelor of Science Engineering degree in Computer Engineering from the University of Michigan-Dearborn are expected to achieve within a few years of graduation the high professional, ethical, and societal goals demonstrated by accomplishing one or more of the objectives described below.

1. Achieve professional growth in an engineering position in regional and national industries. Growth can be evidenced by promotions and appointment in the workplace (management positions, technical specialization), entrepreneurial activities, and consulting activities.
2. Success in advanced engineering studies evidenced by enrollment in graduate courses, completion of graduate degree programs, presentations and publications at professional events, and awards or licences associated with advanced studies.
3. Realization of impactful achievements in societal roles demonstrated by attainment of community leadership roles, mentoring activities, civic outreach service, and active roles in professional societies.

Program Outcomes

The Computer Engineering program is designed to demonstrate that graduates of the program have:

a. an ability to apply knowledge of mathematics, science, and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs
d. an ability to work cooperatively on multi-disciplinary projects
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility
g. proficiency in oral and written communications
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a clear understanding that lifelong learning is essential for sustained professional development
j. a knowledge of contemporary issues and its impact on the engineering profession
k. an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)
**Humanities and the Arts (GEHA)** – 6 Credits  

**Intersections (GEIN)** – 6 Credits  

**Capstone**  
Capstone (GECE) – 3 Credits  

### Major Requirements

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>Basic Preparation for Engineering</strong></td>
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<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
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<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (ECON 201 or 202 also fulfill 3 credits of DDC Social and Behavioral Analysis)</td>
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<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
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<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav (ENT 400 also fulfills 3 credits of DDC Intersections)</td>
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<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
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<tr>
<td>MATH 115</td>
<td>Calculus I</td>
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<tr>
<td>MATH 116</td>
<td>Calculus II</td>
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<tr>
<td>MATH 215</td>
<td>Calculus III</td>
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<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>4</td>
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<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
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<td>or CHEM 144</td>
<td>Gen Chemistry IB</td>
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<td>PHYS 150</td>
<td>General Physics I</td>
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<td>PHYS 151</td>
<td>General Physics II</td>
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<td>ECE 276</td>
<td>Discrete Math in Computer Engr</td>
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<td>or MATH 276</td>
<td>Discrete Math Meth Compr Engr</td>
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<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
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<td><strong>Core Courses</strong></td>
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<tr>
<td>ECE 210</td>
<td>Circuits</td>
<td>4</td>
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<td>ECE 270</td>
<td>Computer Methods in ECE I</td>
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<td>ECE 273</td>
<td>Digital Systems</td>
<td>4</td>
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<td>ECE 311</td>
<td>Electronic Circuits I</td>
<td>4</td>
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<tr>
<td>ECE 3731</td>
<td>Microproc and Embedded Sys</td>
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<tr>
<td>ECE 370</td>
<td>Adv Soft Techn in Comp Engr</td>
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<tr>
<td>ECE 375</td>
<td>Intro to Comp Architecture</td>
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<tr>
<td>ECE 471</td>
<td>Comp Networks/Data Comm</td>
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<td>ECE 473</td>
<td>Embedded System Design</td>
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<td>ECE 475</td>
<td>Comp Hardware Org/Design</td>
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<td>ECE 478</td>
<td>Operating Systems</td>
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<td>ECE 4982</td>
<td>Computer Engineering Des I</td>
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<td>ECE 4984</td>
<td>Computer Engineering Des II</td>
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<td><strong>Professional Electives</strong></td>
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<td>Select two courses from the following list: 7-8</td>
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<tr>
<td>ECE 3171</td>
<td>Analog &amp; Discrete Sig &amp; Sys</td>
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<tr>
<td>ECE 387</td>
<td>Digital Forensics I</td>
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<tr>
<td>ECE 413</td>
<td>Intro to VLSI Design</td>
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<tr>
<td>ECE 428</td>
<td>Cloud Computing</td>
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<tr>
<td>ECE 433</td>
<td>Instr to Multimedia Technologies</td>
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<tr>
<td>ECE 434</td>
<td>Machine Learning in Engin</td>
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<tr>
<td>ECE 435</td>
<td>Intro to Mobil/Smrt Dev &amp; Tech</td>
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<tr>
<td>ECE 438</td>
<td>Web Engr: Prin &amp; Tech</td>
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<tr>
<td>ECE 467</td>
<td>Digital Forensics II</td>
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<tr>
<td>ECE 4881</td>
<td>Introduction to Robot Vision</td>
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<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
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<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
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**Approved Electives**  
Select 8-9 credit hours

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ECE 3171</td>
<td>Analog &amp; Discrete Sig &amp; Sys</td>
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<tr>
<td>ECE 319</td>
<td>Electromagnetic Compatibility</td>
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<td>ECE 385</td>
<td>Elec Materials and Devices</td>
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<td>ECE 387</td>
<td>Digital Forensics I</td>
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<td>ECE 414</td>
<td>Electronic Systems Design</td>
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<td>ECE 415</td>
<td>Power Electronics</td>
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<td>ECE 428</td>
<td>Cloud Computing</td>
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<td>ECE 433</td>
<td>Instr to Multimedia Technologies</td>
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<tr>
<td>ECE 434</td>
<td>Machine Learning in Engin</td>
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<tr>
<td>ECE 435</td>
<td>Intro to Mobil/Smrt Dev &amp; Tech</td>
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<tr>
<td>ECE 4361</td>
<td>Electric Machines and Drives</td>
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<td>ECE 438</td>
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<td>ECE 4432</td>
<td>Renewable Elec Pwr Sys</td>
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<td>ECE 4431</td>
<td>Vehicular Pwr Sys &amp; Loads</td>
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<td>ECE 446</td>
<td>Electromechanical Energy Conv</td>
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<td>ECE 450</td>
<td>Analog and Digital Comm Sys</td>
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<td>ECE 460</td>
<td>Automatic Control Systems</td>
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<td>ECE 467</td>
<td>Digital Forensics II</td>
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<td>ECE 480</td>
<td>Intro to Dig Signal Processing</td>
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<td>ECE 4881</td>
<td>Introduction to Robot Vision</td>
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<td>ECE 491</td>
<td>Directed Studies</td>
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<td>ECE 4951</td>
<td>Sys Design and Microcontrollers</td>
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<td>ENGR 350</td>
<td>Nanoscience and Nanotechnology</td>
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<td>ENGR 399</td>
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<td>IMSE 3005</td>
<td>Intro to Operations Research</td>
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<td>Industrial Robots</td>
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<td>IMSE 421</td>
<td>Eng Economy and Dec Anlys</td>
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<td>IMSE 4425</td>
<td>Human Factors and Ergonomics</td>
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<td>IMSE 4545</td>
<td>Information Systems Design</td>
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<td>ME 230</td>
<td>Thermodynamics</td>
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<td>ME 260</td>
<td>Design Stress Analyses</td>
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<tr>
<td>ME 265</td>
<td>Applied Mechanics</td>
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</table>

Professional and Approved Electives must equal minimum 16 credits
ECE 210  Circuits  4 Credit Hours
Fundamental laws, electrical elements and sources, energy and power. DC analysis of linear circuits. Node and mesh analysis. Operational amplifiers and op-amp circuits, Thevenin and Norton theorems. Sinusoidal steady-state response and the phasor concept. Introductory concepts on complex frequency, average power in AC circuits. Transient responses. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): (MATH 116 or Mathematics Placement with a score of 215) and PHYS 151*
Corequisite(s): ECE 210L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 270  Computer Methods in ECE I  4 Credit Hours
Covers structured and object-oriented computer programming concepts in the context of the C/C++ programming language and engineering applications. Four lecture hours per week with programming assignments.
Prerequisite(s): ENGR 100 and MATH 115*
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 273  Digital Systems  4 Credit Hours
Introduction to digital logic. Topics include numbers and coding systems; Boolean algebra with applications to logic systems; Karnaugh and Quine-McCluskey minimization; combinatorial logic design; flip-flops; sequential network design; and design of digital logic circuits. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): MATH 115*
Corequisite(s): ECE 273L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 276  Discrete Math in Computer Engr  4 Credit Hours
An introduction to fundamental concepts of discrete mathematics for computer engineering. Topics will be chosen from set theory, partially ordered sets, lattices, Boolean algebra, semi-groups, rings, graphical representation of algebraic systems, graphs, and directed graphs. Applications in various areas of computer engineering will be discussed.
Prerequisite(s): (MATH 116 or Mathematics Placement with a score of 215)

ECE 299  Internship/Co-Op  1 Credit Hour
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 300  Signals and Systems  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Fourier analysis of continuous time signals and systems. Laplace transforms with applications to linear system analysis. Introduction to computer software for solving problems involving signals and systems. Three lecture hours and three recitation hours per week.
Prerequisite(s): ECE 210 and (MATH 217* or MATH 227*) and MATH 216*

ECE 305  Intro to Electrical Eng  4 Credit Hours
Introduction to electrical and electronic circuits, machinery, and instrumentation. Topics include Kirchhoff's Laws, Thevenin and Norton theorems, sinusoidal and transient circuit analysis, numerical methods, solid state electronics, motors and generators, measuring instruments. Three lecture hours and one three-hour laboratory analysis. Not open to ECE students.
Prerequisite(s): PHYS 151 and (MATH 205 or MATH 215) and (MATH 217* or MATH 227*)
Corequisite(s): ECE 305L
Restriction(s):
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is Electrical Engineering

ECE 310  Data Science I  4 Credit Hours
This course provides an overview of the mathematical techniques and computer tools needed in the field of data science. The important types of problems addressed in the field of data science are rigorously formulated and analyzed, including regression, pattern recognition and classification, time series prediction, and clustering. Effective mathematical and computational solution methodologies are discussed, including exploratory data analysis, statistical methods, and machine learning. At the end of the course, the student will have an analytic and computational toolkit with which they can solve real problems and "tell a story" with data. (F)
Prerequisite(s): (CIS 1501 or CIS 150 or ECE 270) and (MATH 217 or MATH 227 or MATH 228) and (STAT 325* or IMSE 317* or BENG 364*)
Restriction(s):
Can enroll if Level is Undergraduate

ECE 311  Electronic Circuits I  4 Credit Hours
Terminal characteristics and biasing of semiconductor diodes, bipolar and field-effect transistors, operational amplifiers. Rectifiers, amplifiers, and logic. Design projects. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 210 and (CHEM 134 or CHEM 144) and (COMP 270 or COMP 106 or COMP 220 or COMP 280 or Composition Placement Score with a score of 40)
Restriction(s):
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is Electrical Engineering

ECE 314  Filter Design  3 Credit Hours
Review of filter descriptions, transfer functions, and frequency response characteristics; first and second order passive and active filters; biquad circuits; filter transformations. Butterworth, Chebyshev, and Elliptic filters; OPAMP realization of active filters; sensitivity analysis of active circuits. Three lecture hours per week.
Prerequisite(s): ECE 311 and ECE 317

ECE 316  Computer Electronics  3 Credit Hours
Design of selected electronic circuits such as signal conditioning amplifiers. Switching and digital logic circuits, using FET and BJT devices, A/D and D/A converters. Two-hour lecture and one three-hour lab per week. (YR).
Prerequisite(s): ECE 210 and ECE 273 and (COMP 270* or COMP 106* or Composition Placement Score with a score of 40 or COMP 220*)
ECE 317  Electronic Signals and Systems  4 Credit Hours
Prerequisite(s): MATH 216 and (MATH 217* or MATH 227*) and ECE 311*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ECE 3171  Analog & Discrete Sig & Sys  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Laplace and Z transforms with applications to linear system analysis. Fourier series Fourier Transform and Discrete Fourier Transform, Frequency response, Filter design. Four lecture hours per week.
Prerequisite(s): (MATH 228 or MATH 216) and (MATH 217* or MATH 227*) and ECE 311*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ECE 319  Electromagnetic Compatibility  4 Credit Hours
Introduction, cabling, grounding, balancing and filtering, passive components, shielding, digital circuit noise and PCB layout, radiation, ESD, regulations, demos, experiments, lab projects and guest lectures. Three lecture hours and one three-hour laboratory per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 321  Electromagnetic Fields/Waves  3 Credit Hours
Vector analysis; static electric field; steady electric currents; static magnetic fields; time-varying fields and Maxwell’s equations; plane electromagnetic waves. Three lecture hours per week.
Prerequisite(s): ECE 311*

ECE 329  Intro to Computer Music  4 Credit Hours
This course will introduce students to methods and technologies of computer music. The basics of digital audio will be covered, including sampling, quantization, and compression standards. Various analysis tools will be covered, including the Fourier transform and windowing techniques. Mathematical models of physical instruments will be introduced. Various sound synthesis strategies will be introduced: wave tables, additive synthesis, subtractive synthesis, frequency modulation, and granular synthesis.
Prerequisite(s): MATH 105
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 347  Applied Dynamics  4 Credit Hours
Introduction to rigid, multi-body dynamics tailored to the analysis and design of linkage-based robotic systems. Three dimensional kinematics, Eulerian angles, general motion of rigid bodies subjected to various forcing functions. Matrix methods, numerical and software-based problem solving. Project required. Four lecture hours per week.
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227) or MATH 228
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 351  Bio-Sensors & Instrumentation  4 Credit Hours
The course covers measurements in biological materials using a variety of sensor technologies along with electronic instrumentation design and use. Safety and FDA requirements are also presented.
Prerequisite(s): ECE 305 and (ENGR 216 or ECE 270) and MATH 216 and BIOL 103 and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters

ECE 3641  Robotics I  4 Credit Hours
Design, construction, and testing of field robotic systems. Focus on electronics, instrumentation, and machine elements. Particular attention to modeling dynamic systems, measuring and controlling their behavior, and making decisions about future courses of action. Examples include industrial robots, service robots, mobile robots, and medical robots. Three lecture hours and one three-hour laboratory per week.
Prerequisite(s): (ECE 3731 or ECE 372) and ECE 347
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 370  Adv Soft Techn in Comp Engr  4 Credit Hours
Advanced concepts and techniques of modular object oriented and structured programming; representative real-world computer engineering applications including data structures, search and sorting. A term project is required. Four lecture hours per week. (F,W,S)
Prerequisite(s): ECE 270 and ECE 273*
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 371  Information Structures  3 Credit Hours
Fundamentals of computer data structures. Introduction to abstract data types. Characteristics and implementation of structured data types including arrays, stacks, queues, linked lists, generalized lists, trees, and graphs. Algorithms and applications of data structures in sorting and searching. Considerations of algorithm efficiency and complexity. Engineering applications and design. Three lecture hours per week.
Prerequisite(s): ECE 370 or ECE 274

ECE 372  Intro to Microprocessors  4 Credit Hours
Introduction to operation, interfacing, and applications of microprocessors and microprocessor-based systems. Assembly language programming, interrupts and interfacing. Three lecture hours and one three-hour laboratory per week.
Prerequisite(s): (ECE 270 and ECE 273) or CIS 310 and (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40)

ECE 3731  Microproc and Embedded Sys  4 Credit Hours
This course is an introduction to the operation, interfacing, and applications of micro processor based systems, and real-time embedded system design. Topics include: microprocessor architecture, embedded C programming, real-time programming. Final project required. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): (ECE 270 and ECE 273) or CIS 310
Corequisite(s): ECE 3731L
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
ECE 375 Intro to Comp Architecture 4 Credit Hours
Introduction to architecture of mini- and mainframe computers. CPU, memory, and I/O characteristics. Introduction to parallel architectures and hardware design languages. Case studies of popular computer systems and design considerations. A design project is required. Three lecture hours and one laboratory hour per week.
Prerequisite(s): ECE 270 and ECE 273 and (ECE 276* or MATH 276*) and (ECE 372* or ECE 3731*)
Corequisite(s): ECE 375L
Restriction(s):
Can enroll if College is Engineering and Computer Science
ECE 3801 Intro to Signals and Systems 3 Credit Hours
Prerequisite(s): ECE 210 and MATH 216
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if Level is Undergraduate
Cannot enroll if Major is Electrical Engineering
ECE 385 Elec Materials and Devices 3 Credit Hours
Introduction to properties of conductors, semi-conductors, and insulators. Definitions of stress and strain. Description of the mechanical behavior of solids. Characterization of selected materials; circuit models for resistors, capacitors, inductors, junction and field-effect transistors, etc. Three lecture hours per week.
Prerequisite(s): ECE 311* and (CHEM 144 or CHEM 134)
Restriction(s):
Can enroll if College is Engineering and Computer Science
ECE 3851 Intro Elect Materials & Device 4 Credit Hours
Introduction to properties of conductors, semi-conductors, and insulators. Definitions of stress and strain. Description of the mechanical behavior of solids. Characterization of selected materials; circuit models for resistors, capacitors, inductors, junction and field-effect transistors, etc. Three lecture hours per week and on three-hour laboratory session.
Prerequisite(s): ECE 311* and (CHEM 143 or CHEM 144)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
ECE 387 Digital Forensics I 4 Credit Hours
This course takes a detailed, hands-on approach to study the procedures and techniques used to identify, extract, validate, document and preserve electronic evidence. Students completing this course will be familiar with the core computer science theory and practical skills necessary to perform basic computer forensic investigations, understand the role of technology in investigating computer-based crime, and be prepared to deal with investigative bodies at a basic level.
Prerequisite(s): (ECE 270 or CIS 200) and (ECE 370* or ECE 372* or CIS 310*)
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
ECE 390 Selected Topics in ECE 1 to 3 Credit Hours
Special topics in ECE according to student’s interest and availability of instructors and equipment.
ECE 399 Internship/Co-op 1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Junior or Senior
ECE 411 Electronics II 4 Credit Hours
Review of solid state devices and their physical properties, introduction to the state of art devices, design of operational amplifiers, oscillators, switching and digital circuits. A project will be required. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): ECE 301 and ECE 311
ECE 413 Intro to VLSI Design 3 Credit Hours
Introduction to digital systems and VLSI, CMOS fabrication, layout and CMOS integrated circuits, basic principles of MOSFET theory, CMOS logic circuits, subsystem design, Architecture design and HDL, CLSI chip design, advanced topics, laboratory consist of a series of design projects. Three lecture hours per week.
Prerequisite(s): ECE 273 and ECE 311
ECE 414 Electronic Systems Design 4 Credit Hours
Review of solid state device characteristics and circuit analysis. Design of selected electronic circuits such as operational amplifiers, power amplifiers, power supplies, oscillators, switching and digital circuits to further illustrate analysis and design of representative electronic circuits using classical and computer-aided design techniques. Four lecture/laboratory per week.
Prerequisite(s): ECE 311 and ECE 270*
ECE 415 Power Electronics 4 Credit Hours
Introduction to power electronic circuit analysis and design. Power electronic circuits, power converters, power semiconductors. Time domain analysis emphasized. A design project is required. Four lecture/laboratory hours per week.
Prerequisite(s): (ECE 317 or ECE 3171) and ECE 385
ECE 420 EMC Measurement and Testing 3 Credit Hours
Introduction to EMC measurements, RF measurement fundamentals, EM waves, radiation mechanisms, measurement and measurement systems, screened rooms, open field test sites, practical measurements, conducted emission measurements, radiated emission measurements, radiated immunity, conducted immunity and electrostatic discharge. Projects will be assigned. (YR).
Prerequisite(s): ECE 319

Computer Engineering
ECE 426 Multimedia Forensics 4 Credit Hours
The objective of this course is to introduce current state-of-the-art in digital multimedia editing, its impacts on multimedia tampering, and multimedia forensics techniques to uncover inconsistencies due to tampering. This course will cover existing digital multimedia tampering techniques such as copy-move, cut-and-paste, etc. and digital multimedia tamper detection techniques. The course will also cover covert communication methods such as steganography and covert channel detection. This course will cover the limitations of existing state-of-the-art in multimedia forensics. Hands-on experience will be provided in various aspects of multimedia tampering and analysis through the numerous assignments and projects. Three lecture hours per week and one three-hour laboratory per week. (F)
Prerequisite(s): (ECE 387 or CIS 387) or CIS 447 or ECE 317
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 427 Digi Content Protec 4 Credit Hours
The objective of this course is to introduce current techniques information security in general and multimedia security in particular. This course will cover existing information hiding techniques such as digital watermarking, steganography, and fingerprinting. The course will also cover conventional digital content protection methods such as cryptography. This course will cover the pros and cons of conventional and non-conventional digital content protection methods and associated design issues to give the student hands-on experience in various aspects of information security and analysis through the various assignments and projects. (W)
Prerequisite(s): (ECE 387 or CIS 387) or CIS 447 or ECE 317
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 428 Cloud Computing 3 Credit Hours
Cloud computing represents the emerging Internet-based services/platforms with elastic and scalable computation power operating at costs associated with service. Topics may include advanced web technologies (AJAX and Mashup), distributed computing models and technologies (Hadoop and MapReduce), Infrastructure-as-a-Service (IaaS), Software as a Service (SaaS), Platform-as-a-Service (PaaS), virtualization, parallelization, security/privacy, and other issues in cloud computing. This course will also explore the current challenges facing cloud computing. Course work will include homework assignments, presentations and a term project. Students cannot take both ECE 428 and ECE 528 for degree credit. Three lecture hours per week.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 431 Electrical Eng Design 4 Credit Hours
The course is conducted as a guided project design course with the class divided into teams and assigned a specific design project. Periodic progress reports are submitted during the term. A final written report and an oral presentation including demonstration are required at the end of the term. Cost analysis, evaluation of design alternatives and application of engineering principles are emphasized. Two scheduled contact hours and six hours open laboratories per week.
Prerequisite(s): ECE 311 and ECE 373 and ECE 493*

ECE 432 Electrical Eng Design 6 Credit Hours
The course is conducted as a guided project design course over a two-semester period with the class divided into teams and assigned a specific design project. Periodic progress reports are submitted during the term. A final written report and an oral presentation including demonstration are required at the end of the term. Cost analysis, evaluation of design alternatives and application of engineering principles are emphasized. Two scheduled contact hours and six hours open laboratories per week.
Prerequisite(s): ECE 311 and ECE 372 and ECE 493*

ECE 433 Intr to Multimedia Technolgies 4 Credit Hours
This course will introduce students to basic terminology and methods of multimedia. Basic concepts of digital audio will be reviewed, including frequency, sampling, and popular compression schemes. Concepts of digital images will be introduced, such as resolution, color theory, and compression formats. Basic concepts of digital video and animation will be introduced. Relevant web technologies will be reviewed. Four lecture hours per week.
Prerequisite(s): ECE 311 or ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ECE 434 Machine Learning in Engin 4 Credit Hours
Introduce fundamental theories and basic techniques in machine learning with an emphasis on engineering applications. Topics include learning concepts, search algorithms, neural networks, fuzzy learning, paradigms for problem solving using machine learning. (F, W).
Prerequisite(s): ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ECE 435 Intro to Mobil/Smrt Dev & Tech 4 Credit Hours
This class will introduce students to the technology used in mobile/smart devices and mobile communication networks. Various hardware and software aspects will be introduced, with particular emphasis on the constraints intrinsic to such systems. Students will get an overview of various mobile operating systems and how to develop software for mobile devices. Four lecture hours per week.
Prerequisite(s): ECE 372 or ECE 3731
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering
ECE 436  Elec Machines & Hybrid Drives  4 Credit Hours
This is an introductory course on electric machines and drive systems and their application in EV, HEV, PHEV and FCV powertrains. The objectives are to familiarize the students with the basic concepts of electromechanical energy conversion and electric drive systems. Students are expected to be able to analyze and design electric drive systems for automotive powertrain applications. The topics covered in this course include DC machines, induction machines, permanent magnet synchronous machines, and switched reluctance motors and drives. Case studies in automotive applications such as electric and hybrid drivetrains will be discussed. Four lecture hours per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering

ECE 4361  Electric Machines and Drives  4 Credit Hours
This is an introductory course on electric machines and drive systems and their application in HEV/PHEV powertrain and other industrial and residential systems. The objectives are to familiarize the students with the basic concepts of electromechanical energy conversion and electric drive systems. Students are expected to be able to analyze and design electric drive systems for automotive, industrial, and residential applications. The topics covered in this course include DC machines, induction machines, permanent magnet synchronous machines, and switched reluctance motors and drives. Case studies in automotive applications such as electric and hybrid drivetrains, industrial and residential electric variable speed drive systems, will be discussed. Students cannot take both ECE 436 and ECE 4361 for credit. Four lecture hours per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Computer Engineering, Software Engineering, Computer & Information Science, Electrical Engineering

ECE 437  Intro to Automotive Cybersec  4 Credit Hours
The objective of this course is to introduce modern vehicles, in-vehicle communication networks and protocols such as CAN, LIN, and so on, threat models, diagnostics, and penetration testing. This course will cover existing in-vehicle communication protocols and associated vulnerabilities. Students are expected to learn penetration testing for automotive systems. This course will cover the limitations of existing state-of-the-art in multimedia forensics. Simulation tools, labs and projects will be used to provide hands-on learning experience in various aspects of in-vehicle communication. (W,YR).
Prerequisite(s): ECE 3731* or ECE 372*
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 438  Web Engr: Prin & Tech  4 Credit Hours
Advanced concepts and techniques of web technology, focusing on interactive applications; real-world web engineering applications including data persistence, web security, hardware/software issues and asynchronous client/server communication. A term project is required. Four lectures per week.
Prerequisite(s): ECE 311 or ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering

ECE 443  Intr to Electric Power Systems  3 Credit Hours
This course will introduce students to basic methods of electric power systems. Topics include AC circuits, phasors, complex power and complex impedance, transformers, per unit system, transmissions lines, power flow, economic dispatch, real and reactive power control, symmetric and unsymmetric faults, transient stability, relaying and protection. Three lecture hours per week.
Prerequisite(s): ECE 317 or ECE 3171

ECE 4431  Vehicular Pwr Sys & Loads  4 Credit Hours
This is an introductory course on power systems and load analysis with focus on automotive applications. The objectives are to familiarize the students with the basic principles and concepts of vehicular power systems and loads. Students are expected to be able to analyze and design basic vehicular power systems. The topics covered in this course include an overview of power systems, vehicular power system architecture, DC and AC power grid in vehicular systems, power system stability, reliability, reactive power control, load flow analysis, short circuit analysis, and vehicular power system protection. Four lecture hours per week.
Prerequisite(s): ECE 317 or ECE 3171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ECE 4432  Renewable Elec Pwr Sys  4 Credit Hours
This course is an introduction to traditional power grids as well as renewable electric power systems. This course covers long-distance transmission of electric power with emphasis on admittance and impedance modeling of components and systems, complex power-flow studies, symmetrical and unsymmetrical fault calculations, economic operation of large-scale generation and transmission systems, an overview of emerging renewable energy technologies (e.g. wind and solar) and the impact of grid integration of renewable energy on power grids. Students cannot take both ECE 4431 and ECE 4432 for credit. Four lecture hours per week.
Prerequisite(s): ECE 3171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering
ECE 446  Electromechanical Energy Conv  4 Credit Hours
Introduces fundamental concepts and specifications of electromechanical energy conversion: AC and DC machines, drive, electric and magnetic storage and transfer, transformer, and performance analysis of AC and DC machines. The topics include principles of energy conversion, permanent magnet synchronous machines, induction machines, and DC machines. The lab projects for the course will focus on modeling, evaluation, and practice of AC and DC machine drives based on computer simulation and DSP based experiments; transient and dynamic analysis; linearization and small signal analysis of machines. Four lecture/laboratory hours per week.
Prerequisite(s): ECE 311 and (ECE 317* or ECE 3171*)

ECE 450  Analog and Digital Comm Sys  4 Credit Hours
Topics include introduction to communication systems, baseband communications, sampling theorem, amplitude and frequency modulation systems design, statistical analysis of error and performance, digital modulation of analog signals, digital communication and digital modulation schemes, random processes and applications in digital communications, and noise analysis, optimal receiver. Four lecture hours per week.
Prerequisite(s): (ECE 317 or ECE 3171) and IMSE 317

ECE 451  Signal Detection  3 Credit Hours
Introduction to signal detection, parameter estimation and information extraction theory and its application to communication systems. Subject areas covered within the context of a digital environment are decision theory, detection and estimation of known and random signals in noise, adaptive recursive digital filtering, optimal linear filtering and pattern recognition. Three lecture hours.
Prerequisite(s): ECE 450

ECE 452  Probabilistic Meth/Signal Alys  3 Credit Hours
Introduction to probability, random processes, correlation functions, and spectral density. Response of linear systems to random inputs. Applications in the field of communications.
Prerequisite(s): ECE 300

ECE 454  Intr to Modern Wireless Comm  3 Credit Hours
This course provides an introduction to the fundamentals of modern wireless communication. The focus of this course will be on the (i) basic signal propagation issues and channel impairments, (ii) modulation schemes and bandwidth/power trade-offs, and (iii) overcoming channel impairment using equalizers, diversity and channel coding. Additionally, case studies will examine current wireless LANs and cellular systems. Three Hours of lecture per week.
Prerequisite(s): ECE 450 or ECE 471
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 456  Intro to Electro-optics  3 Credit Hours
Laser sources, detectors, imaging systems, optical signal processing, illumination and image acquisition, triangulation, and fiber optics. Three one-hour lecture periods.
Prerequisite(s): ECE 311 and ECE 321

ECE 460  Automatic Control Systems  4 Credit Hours
Modeling and response of dynamic systems. Transfer functions, poles and zeros and their significance to transient and steady state response of feedback systems. Analysis of stability of closed-loop systems. Steady state errors and transient performance of closed-loop systems. Design of feedback control systems by root locus techniques and by frequency domain methods. Laboratory projects include modeling, controller design, controller realization, system performance evaluation, and simulation studies. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 317 or ECE 3171
Corequisite(s): ECE 460L

ECE 464  Robotics  4 Credit Hours
This is the second of a two-course sequence introducing foundational theory and applications of robotics engineering. The topics of this course include embedded computing, locomotion, localization, dead reckoning, inertial sensors and perception, navigation, multi-robotics systems, and human-robot interaction, and complex response processes. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 3641 and ECE 370 and IMSE 317
Restriction(s):
Can enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 465  Digital Control Design and Imp  4 Credit Hours
Discrete model of a continuous-time system. Differential equations and Z-transforms. Similarities and differences between discrete-time and continuous-time models. Translation of analog designs to digital designs. State-space methods including state feedback and observers. Hardware limitations and implementation issues. Four lecture/laboratory hours per week.
Prerequisite(s): ECE 460

ECE 467  Digital Forensics II  4 Credit Hours
This course is a continuation of Digital Forensics I and will focus on Internet Forensics. Students will examine in-depth concepts in Internet evidence collection and preservation, as well as applications of contemporary commercial forensic investigative software.
Prerequisite(s): (ECE 387 or CIS 387) and (ECE 471* or CIS 427*)
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if Level is Rackham or Graduate
Cannot enroll if College is Business

ECE 470  Computer Int and Data Comm  4 Credit Hours
Hardware and software techniques used in interfacing between computers and other computers or devices. Analog and digital techniques. Parallel and serial communications. Popular communication protocols. Error detection and correction. Lab project involves interfacing and communicating with a microprocessor.
Prerequisite(s): ECE 372
ECE 471  Comp Networks/Data Comm  4 Credit Hours
Hardware and software techniques used in interfacing between computers and other computers or devices. Data transmission techniques and protocols. Introduction to popular local area network protocols. Forward Error Control Techniques and Data Compression. Introduction to wireless communications with focus on major challenges and obstacles and the cellular phone infrastructure. Term projects involve developing a data link layer protocol for interfacing and communication with microprocessors. Four lecture hours per week.
Prerequisite(s): (ECE 372 or ECE 3731) and (IMSE 317 or BENG 364)

ECE 473  Embedded System Design  4 Credit Hours
This course studies the issues dealing with real-time embedded system design. Topics include: microprocessor architecture, assembly language, real-time programming, space and time limitations, relations between ANSI C Compiler output and assembly language, compiler linkers and using a system development package for C programming. (F,W,S).
Prerequisite(s): ECE 372 or ECE 3731
Corequisite(s): ECE 473L

ECE 474  Compiler Design  3 Credit Hours
Principles of language compilation. Introduction to formal languages. Lexical analysis, top-down and bottom-up parsing, code generation and optimization. Error handling and symbol table management. Run-time storage management. Programming language design. Introduction to compiler-writing tools. A software design project is required. Three lecture hours per week.
Prerequisite(s): ECE 370

ECE 475  Comp Hardware Org/Design  4 Credit Hours
Design methodology, performance analysis using probability and statistic methods, hardwired and microprogramming in CPU design, hardware design languages and memory design. Advanced concepts in computer architecture. A design project is required. Three lecture hours per week and one-three hour laboratory per week.
Prerequisite(s): ECE 375

ECE 476  Intro to Parallel Processing  3 Credit Hours
Advances in computer architecture, parallel structures, performance evaluation, memory bandwidth considerations, processing bandwidth, communication and synchronization. A design project is required. Three lecture hours per week.
Prerequisite(s): ECE 375

ECE 478  Operating Systems  4 Credit Hours
Introduction to computer operating systems. Process management, threads, CPU scheduling, memory management, process synchronization, file systems and I/O devices. Selected advanced topics, e.g., distributed systems, deadlock, I/O, job scheduling, and performance analysis using queueing models, will be introduced. Case studies of modern operating systems. A design project is required. Four lecture hours per week.
Prerequisite(s): ECE 370 and IMSE 317

ECE 479  Artificial Intelligence  3 Credit Hours
Basic concepts and methodology of artificial intelligence from a computer engineering perspective. Emphasis is placed on the knowledge representations, reasoning and algorithms for the design and implementation of intelligent systems. Introduction to an AI language and representative intelligence systems. A design project is required. Three lecture hours per week.
Prerequisite(s): ECE 370

ECE 480  Intro to Dig Signal Processing  4 Credit Hours
Prerequisite(s): (ECE 317 or ECE 3171) and (MATH 217 or MATH 227 or MATH 228)
Corequisite(s): ECE 480L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 488  Introduction to Machine Vision  4 Credit Hours
Applications to machine vision. Representative topics are: optics and lighting, sensor characteristics, image acquisition, image analysis, segmentation, connectivity, shape description, hardware for vision applications, software considerations, applications including automatic inspection and metrology. Open lab and project will be required.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Senior

ECE 4881  Introduction to Robot Vision  3 Credit Hours
This course introduces the theories and modern technologies in robot vision. Topics include sensors, image analysis, region and segmentation, object recognition, stereo vision, optical flow, color image, object tracking and applications. Students cannot receive credit for both ECE 4881 and ECE 588. Three lecture hours per week.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 490  Selected Topics in Elec Engin  1 to 3 Credit Hours
Advanced or applied topics in electrical engineering offered according to student’s interest and availability of instructors and equipment. Lecture hours, laboratory, and/or computation period to be arranged.

ECE 491  Directed Studies  1 to 4 Credit Hours
Student in consultation with a faculty advisor will prepare a proposal in sufficient detail describing a subject topic to be studied. The proposal will be subject to approval by the department. A formal written and oral evaluation of the work performed are required for successful completion. Lecture hours, laboratory, and/or computation periods to be arranged.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 492  Directed Research  1 to 4 Credit Hours
Student, in consultation with a faculty advisor will prepare a proposal in sufficient detail describing a research problem to be studied. The proposal will be subject to approval by the department. A formal written and oral evaluation of the research performed are required for successful completion. Lecture hours, laboratory, and/or computation periods to be arranged.
Restriction(s):
Can enroll if Class is Senior or Graduate
ECE 493  Design Factors in Eng  2 Credit Hours
This course is comprised of a series of lectures on the subject of design. It will promote awareness of such factors as literature review, performance specifications, design considerations, product liability, standards and ethics, professional registration codes, patents and copyrights, packaging, documentation and report preparation. Two lecture hours.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 495  Micro Systems Design  4 Credit Hours
Course content includes discussion and laboratory experience on a number of interfacing topics (timing, serial and parallel communication, ADC/DAC, control loop) and the preparation of a major report on a design topic approved by the course instructor. Team design projects may involve either software or hardware, or both. Two lecture hours and two three-hour laboratories per week.
Prerequisite(s): ECE 373 and (ECE 311 or ECE 316)

ECE 4951  Sys Design and Microcontrollers  3 Credit Hours
Techniques for interfacing actuators and sensors to computers with emphasis on the use of a variety of microprocessors and a broad range of sensors. Topics include introduction to small microprocessors such as PIC16, PIC18, small systems such as opic, basicx as well as using a PC as a controller. Control of motors and other actuators using opto-isolators and discrete electronics, use of H-bridges. Interfacing sensors that provide different encoding data, such as analog signals, digital communication using I2C protocol, handshake I/O, pulse width encoding. Interfacing to wireless communication using RF or IR. Includes laboratory experiments, individual midterm project and a final team project. Three lecture hours per week. (FW)
Prerequisite(s): ECE 311 and (ECE 372 or ECE 3731)

ECE 498  Senior Engineering Design  3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.
Prerequisite(s): (ECE 311 or ECE 316) and ECE 373

ECE 4981  Electrical Engineering Des I  2 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade-offs.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or COMP 280) and (ECE 317 or ECE 3171) and (ECE 372 or ECE 3731) and (ECE 414 or ECE 415 or ECE 450 or ECE 460 or ECE 480 or ECE 4951)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4982  Computer Engineering Des I  2 Credit Hours
This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade-offs.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40) and (ECE 317 or ECE 3171) and ECE 372 and (ECE 414 or ECE 415 or ECE 450 or ECE 460 or ECE 480 or ECE 4951)
Restriction(s):
Can enroll if Class is Senior
ECE 4986  Computer Engineering Design  3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation, and application of demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.
Prerequisite(s): (COMP 270 or Composition Placement Score with a score of 40 or COMP 106 or COMP 220) and (ECE 317 or ECE 3171) and ECE 372 and ECE 375 and (ECE 471 or ECE 473 or ECE 478 or ECE 475)
Restriction(s):
Can enroll if Class is Senior

ECE 4987  Robotics Engineering Design I  2 Credit Hours
This course is conducted as a guided project design course over a two-course sequence, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.
Prerequisite(s): ECE 311 and ECE 3171 and (ECE 372 or ECE 3731) and ECE 3641 and (ECE 460 or ECE 4641)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4988  Robotics Engineering Design II  2 Credit Hours
Second semester Robotics Engineering Design: This course is conducted as a guided project design course over a two-course sequence, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.
Prerequisite(s): ECE 4987
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 499  Internship/Co-op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Cybersecurity and Information Assurance
In the last ten years, there has been much data demonstrating that there is a rapid rise in the incidence of cyber-attacks targeting individuals, organizations, and even countries. Consequently, cybersecurity and information assurance are the US government’s top priorities, as seen in various Presidential Directives and the US Justice Department document High Priority Criminal Justice Technology Needs. The US has identified cybersecurity as one of the rising workforce areas, from both public and private sectors. The Bachelor of Science in Cybersecurity and Information Assurance (CIA) program at the Department of Computer and Information Science aims to educate and train an elite, diverse cadre of students, who are ready to address real-world computer security and criminal justice challenges. It will also benefit any individual who is interested in advancing their knowledge of computer security and privacy.

Cybersecurity and Privacy Concentration
The Cybersecurity and Privacy (CP) concentration educates students in the fundamentals and principles of cybersecurity and privacy and provides students with labs and experiences that encourage creative thinking. It is built upon a rigorous undergraduate background in computer and information science. Students in this concentration study fundamental security and privacy concepts such as confidentiality, integrity, access control, security architecture and systems, attack/defense. This concentration also provides a sequence of courses that cover unique security and privacy issues in various application areas, ranging from computer security to network security, from wired security to wireless security, from data security to application security, from every day security to enterprise security.

Digital Forensics Concentration
Digital Forensics (DF) is the area of computer science concerned with the examination and analysis of computer hard drives, storage devices, cell phones, tablets, or any electronic device that may hold evidence which could be used in a court of law. The device could be as simple as a cell phone or as complex as a main server for a large corporation. The digital forensics analyst uncovers and preserves data for later use as legal evidence, and analyzes the data in light of a particular crime or criminal or civil investigation. This may involve determining how hackers or unauthorized persons gained access to information or computer systems as well as where and how they navigated within the system.

Digital forensics specialists recover files and emails or other electronic correspondence that have been deleted or erased. They also recover data after hardware or software failure, and develop means to harden computer, cyber, and data security against loss, corruption, sabotage, or external attack.

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)
Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
• Lecture/Lab Science Course
• Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)
Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)
Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a B.S. degree in Cybersecurity and Information Assurance from UM-Dearborn.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td>PHIL 240</td>
<td>Ethics (Also fulfills 3 credits of DDC Humanities and the Arts)</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (ECON 201 or 202 also fulfill 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization (Also fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>CRJ 200</td>
<td>Intro to Criminal Justice (Also fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Laboratory Science Sequence

Select one from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130 &amp; BIOL 140</td>
<td>Intro Org and Environ Biology and Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>CHEM 134 &amp; CHEM 136</td>
<td>General Chemistry IA and General Chemistry IIA</td>
<td></td>
</tr>
<tr>
<td>GEOL 118 &amp; GEOL 218</td>
<td>Physical Geology and Historical Geology</td>
<td></td>
</tr>
<tr>
<td>PHYS 125 &amp; PHYS 126</td>
<td>Introductory Physics I and Introductory Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 150 &amp; PHYS 151</td>
<td>General Physics I and General Physics II</td>
<td></td>
</tr>
</tbody>
</table>

Business

ACC 298 | Financial Accounting | 3 |

CIA Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 150</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 310</td>
<td>Computer Org and Assembly Lang</td>
<td>4</td>
</tr>
<tr>
<td>CIS 350</td>
<td>Data Struc and Algorithm Anlys</td>
<td>4</td>
</tr>
<tr>
<td>CIS 375</td>
<td>Software Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 421</td>
<td>Database Mgmt Systems</td>
<td>4</td>
</tr>
<tr>
<td>CIS 427</td>
<td>Comp Networks and Dis Process</td>
<td>4</td>
</tr>
<tr>
<td>CIS 435</td>
<td>Web Technology</td>
<td>3</td>
</tr>
<tr>
<td>CIS 450</td>
<td>Operating Systems</td>
<td>4</td>
</tr>
</tbody>
</table>

Capstone

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 4951</td>
<td>Design Seminar I</td>
<td>2</td>
</tr>
<tr>
<td>CIS 4952</td>
<td>Design Seminar II</td>
<td>2</td>
</tr>
</tbody>
</table>

Students must choose a concentration in Digital Forensics or Cybersecurity and Privacy. Concentration requirements listed below.

CIA Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

Students must select electives not already used to fulfill the requirements of a concentration area. Select the number of elective credits needed for your concentration.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 285</td>
<td>Software Engineering Tools</td>
<td>4</td>
</tr>
<tr>
<td>CIS 299</td>
<td>Internship</td>
<td>4</td>
</tr>
<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
<td>4</td>
</tr>
<tr>
<td>CIS 376</td>
<td>Software Engineering II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 381</td>
<td>Industrial Robots</td>
<td>4</td>
</tr>
<tr>
<td>CIS 387</td>
<td>Digital Forensics I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 399</td>
<td>Internship</td>
<td>4</td>
</tr>
<tr>
<td>CIS 411</td>
<td>Natural Language Processing</td>
<td>4</td>
</tr>
<tr>
<td>CIS 425</td>
<td>Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>CIS 436</td>
<td>Mobile App Des &amp; Impl</td>
<td>4</td>
</tr>
<tr>
<td>CIS 437</td>
<td>Advanced Networking</td>
<td>4</td>
</tr>
<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
<td>4</td>
</tr>
<tr>
<td>CIS 449</td>
<td>Intro to Software Security</td>
<td>4</td>
</tr>
<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 476</td>
<td>Soft Arch &amp; Design Patterns</td>
<td>4</td>
</tr>
<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel</td>
<td>4</td>
</tr>
<tr>
<td>CIS 487</td>
<td>Computer Game Design &amp; Impl</td>
<td>4</td>
</tr>
</tbody>
</table>
Concentration Requirements for Digital Forensics Concentrators

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIA-Digital Forensics Required</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>CIS 387</td>
<td>Digital Forensics I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
<td>3</td>
</tr>
<tr>
<td>or ECE 426</td>
<td>Multimedia Forensics</td>
<td></td>
</tr>
<tr>
<td>or ECE 427</td>
<td>Digi Content Protec</td>
<td></td>
</tr>
<tr>
<td>CRJ 468</td>
<td>Criminology</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 475</td>
<td>Digital Evidence</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 487</td>
<td>Forensic Science</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 409</td>
<td>Intel and Homeland Security</td>
<td>3</td>
</tr>
<tr>
<td>or CRJ 474</td>
<td>Cyber Crimes</td>
<td></td>
</tr>
<tr>
<td>4-5 credits of approved electives from list below</td>
<td>4-5</td>
<td></td>
</tr>
</tbody>
</table>

Concentration Requirements for Cybersecurity and Privacy Concentrators

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIA-Cybersecurity and Privacy Required</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
<td>3</td>
</tr>
<tr>
<td>CIS 446</td>
<td>Wireless &amp; Mobi Comp Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 4851</td>
<td>Data Security and Privacy</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 409</td>
<td>Intel and Homeland Security</td>
<td>3</td>
</tr>
<tr>
<td>ECE 427</td>
<td>Digi Content Protec</td>
<td>4</td>
</tr>
<tr>
<td>MATH 396</td>
<td>Introduction to Cryptography</td>
<td>3</td>
</tr>
<tr>
<td>6 credits of approved electives from list below</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Data Science

With increasing availability of data, companies, governments, and nonprofits alike are striving to convert information into actionable information and insight. In the past, students trained in singular disciplines such as computer science, operations research, or statistics had the skill set needed to analyze the required data. But the “volume”, “velocity” and “variety” of today’s data and future data streams pose unique challenges and also creates unique opportunities. Present data sets requires more programming, mathematics/statistics, modeling skills, and domain knowledge than a traditional undergraduate curriculum offers. In fact, one of the obstacles that must be removed before government, business and social sectors are prepared to use large datasets to enhance their decision-making, is the acquisition of a trained workforce that can leverage it.

Decision makers require data and evidence before resources are committed. In the current environment, commitments are not made unless evidence supports that the opportunities are both cost effective and yield positive net benefits. Healthcare practitioners seek evidence-based medicine; social scientists engage in impact assessments; business analysts practice decision science and engineers and computer scientists desire facility with big data sets using a variety of statistical techniques.

The University of Michigan-Dearborn, with its strong Engineering, Mathematics, Social and Behavioral Sciences, and Business Management programs is in a strategic position to enhance both undergraduate and graduate education with data science course offerings and a Bachelor of Science in Data Science. UM-Dearborn’s recent addition of the Department of Health and Human Services is also uniquely positioned in time, developmental stage, and location, to benefit from data science offerings. In other words, a case could be made for data science programming that enhances student education and marketability in all four of UM-Dearborn’s Colleges—the College of Engineering; the College of Arts, Sciences and Letters; the College of Business and the newly formed College of Education, Health and Human Services.

The Bachelor of Science in Data Science degree is housed within the College of Engineering and Computer Science. The interdisciplinary nature of this degree program will require resources from all academic units, namely the College of Business, the College of Engineering and Computer Science, the College of Arts, Sciences, and Letters and the College of Education, Health, and Human Services. Students in this program will take courses and be involved with scholarly activity from a number of departments and disciplines across campus including Management Studies, Computer and Information Science, and Health and Human Services, Behavioral Science, Social Science as well as the Mathematics and Engineering disciplines.

This program requires technical courses from each college on our campus and is highly multidisciplinary. Taking a multidisciplinary approach, the curriculum is designed to leverage existing courses on campus and combine these with foundational courses in data science. This creates synergy among academic units on campus, provides flexibility in scheduling, and allows for timely completion of the program. Students with varied backgounds can take different courses to suit their needs, based on interest and guided by faculty advisors.
Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Concentration Requirements

A candidate for the degree Bachelor of Science in Data Science is required to pursue scholastic quality and to complete satisfactorily the following program of study:

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a B.S. degree in Data Science from UM-Dearborn.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>General Requirements</strong></td>
<td></td>
</tr>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Basic Requirements</strong></td>
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</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Natural Science</strong></td>
<td></td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>8</td>
</tr>
<tr>
<td>&amp; BIOL 140</td>
<td>and Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CHEM 136</td>
<td>and General Chemistry IIA</td>
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<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>8</td>
</tr>
<tr>
<td>&amp; GEOL 218</td>
<td>and Historical Geology</td>
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</tr>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 126</td>
<td>and Introductory Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 151</td>
<td>and General Physics II</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Ethics</strong></td>
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<tr>
<td>HHS 470</td>
<td>Information Science and Ethics</td>
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<tr>
<td></td>
<td><strong>Business Course</strong></td>
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<tr>
<td>ENGR 400</td>
<td>Appl Business Tech for Engr (Fulfills 3 credits of DDC Intersections)</td>
<td>3</td>
</tr>
<tr>
<td>or ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav</td>
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<tr>
<td></td>
<td><strong>Data Science Applications</strong></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Students should complete 18 credit hours in one of the following</td>
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</tr>
<tr>
<td></td>
<td>analytics areas listed below. Application area courses must be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>approved in advance by Department Chair.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applied Social and Behavioral Science Analytics</td>
<td></td>
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<tr>
<td></td>
<td>Take an additional 18 credits from any of the following: Political</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science, Economics, History, Criminal Justice, Sociology,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anthropology, and Psychology. Students must meet the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>prerequisites for each course. In addition, the 18 disciplinary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>credits must have the same prefix, e.g. POL, ECON, HIST, CRJ,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOC, ANTH, or PSYC. As an exception, a student may substitute 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>credits of GIS for 6 of the discipline specific credits.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business Analytics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Take DS 310 (3) Data Mining for Business Intelligence, plus 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>credit hours in one of the following: Accounting, Finance,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technology Management, and Supply Chain Management. Students must</td>
<td></td>
</tr>
<tr>
<td></td>
<td>meet the prerequisites for the course. In addition, the additional 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>credit hours must have the same prefix, e.g. ACC, FIN, MKT, ITM, or OM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computational Analytics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Take an additional 18 credit hours from courses focusing on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applied Statistics, Mathematics or from CECS. The proposed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coursework must be approved by a faculty advisor in the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Mathematics or CECS, respectively, prior to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>enrollment in the course.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health and Medicine Analytics</td>
<td></td>
</tr>
</tbody>
</table>

Title

University of Michigan-Dearborn 2019-2020 635
Take an additional 18 credit hours from courses focusing on health and medicine. The proposed coursework must be approved by a faculty advisor in the Department of Health and Human Services prior to enrollment in the course.

**Data Science Core**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 1501</td>
<td>CS I for Data Scientists</td>
<td>4</td>
</tr>
<tr>
<td>CIS 2001</td>
<td>CS II for Data Scientists</td>
<td>4</td>
</tr>
<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
<td></td>
</tr>
<tr>
<td>MATH 276</td>
<td>Discrete Math Meth Comptr Engr</td>
<td></td>
</tr>
<tr>
<td>MATH 315</td>
<td>Applied Combinatorics</td>
<td></td>
</tr>
<tr>
<td>CIS 350</td>
<td>Data Struc and Algorithm Anlys</td>
<td>4</td>
</tr>
<tr>
<td>CIS 375</td>
<td>Software Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3100</td>
<td>Data Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 3200</td>
<td>Data Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 422</td>
<td>Massive Data Management</td>
<td>4</td>
</tr>
<tr>
<td>STAT 305</td>
<td>Intro. to Data Science</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 325</td>
<td>Applied Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 430</td>
<td>Applied Regression Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data Science Capstone**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 4971</td>
<td>Cap Sem for Data Sci I</td>
<td>2</td>
</tr>
<tr>
<td>CIS 4972</td>
<td>Cap Proj for Data Sci II</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data Science Electives** 9-10

Choose 9-10 credits from list below

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 306</td>
<td>Discrete Structures II</td>
</tr>
<tr>
<td>CIS 411</td>
<td>Natural Language Processing</td>
</tr>
<tr>
<td>CIS 423</td>
<td>Dec Support and Exp Systems</td>
</tr>
<tr>
<td>CIS 425</td>
<td>Information Systems</td>
</tr>
<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel</td>
</tr>
<tr>
<td>CIS 481</td>
<td>Computational Learning</td>
</tr>
<tr>
<td>CIS 4851</td>
<td>Data Security and Privacy</td>
</tr>
<tr>
<td>DS 426</td>
<td>Introduction to Simulation</td>
</tr>
<tr>
<td>ECE 427</td>
<td>Digi Content Protec</td>
</tr>
<tr>
<td>ECE 428</td>
<td>Cloud Computing</td>
</tr>
<tr>
<td>ECE 434</td>
<td>Machine Learning in Engin</td>
</tr>
<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
</tr>
<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
</tr>
<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
</tr>
<tr>
<td>IMSE 3005</td>
<td>Intro to Operations Research</td>
</tr>
<tr>
<td>IMSE 421</td>
<td>Eng Economy and Dec Anlys</td>
</tr>
<tr>
<td>IMSE 440</td>
<td>Applied stat models in engin</td>
</tr>
<tr>
<td>IMSE 4585</td>
<td>Simulation in Systems Design</td>
</tr>
<tr>
<td>IMSE 4795</td>
<td>Prod, Inven Control &amp; Lean Mfg</td>
</tr>
<tr>
<td>MATH 420</td>
<td>Stochastic Processes</td>
</tr>
<tr>
<td>MATH 425</td>
<td>Mathematical Statistics</td>
</tr>
<tr>
<td>MATH 462</td>
<td>Mathematical Modeling</td>
</tr>
<tr>
<td>MATH 472</td>
<td>Intro to Numerical Analysis</td>
</tr>
<tr>
<td>MATH 473</td>
<td>Matrix Computation</td>
</tr>
<tr>
<td>STAT 327</td>
<td>Statistical Computing</td>
</tr>
<tr>
<td>STAT 440</td>
<td>Design and Analysis of Expermt</td>
</tr>
<tr>
<td>STAT 450</td>
<td>Multivariate Stat Analysis</td>
</tr>
<tr>
<td>STAT 460</td>
<td>Time Series Analysis</td>
</tr>
</tbody>
</table>

**General Electives**

As needed to get a minimum of 120 credits for graduation

**Dual Degree Programs**

- BSE, Bioengineering/Mechanical Engineering (p. 636)
- BS, Computer and Info Systems/Cybersecurity (p. 638)
- BS, Computer and Info Systems/Data Science (p. 639)
- BSE, Electrical/Computer Engineering (p. 641)
- BSE, Industrial and Systems Engineering/Manufacturing Engineering (p. 642)
- BSE, Manufacturing/Mechanical Engineering (p. 644)

**Bio/Mechanical Engineering**

Students with an interest in both areas can pursue a dual B.S.E. program in Bioengineering and Mechanical Engineering and thus can earn two B.S.E. degrees at the same time:

- B.S.E. degree in Bioengineering
- B.S.E. degree in Mechanical Engineering

The dual degree program requires specified coursework that equals a minimum of 143 total credits.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

- Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gewo)
- Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gewo)
- Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

- Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-education-program-dearborn-discovery-core/#gens)
  - Lecture/Lab Science Course
  - Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits

Humanities and the Arts (GEHA) – 6 Credits

Intersections (GEIN) – 6 Credits

Capstone

Capstone (GECE) – 3 Credits

Major Requirements

A candidate for the Dual B.S.E. in Bioengineering and Mechanical Engineering is required to pursue scholastic quality and to complete satisfactorily the following program of study:

Basic PREP Requirements (61)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (Also fulfills 3 credits of DDC Social and Behavioral Analysis) or ECON 202 Prin: Microeconomics</td>
<td></td>
</tr>
</tbody>
</table>

Intro to Engineering: 2
ENGR 100 | Intro to Eng and Computers | 2

Engineering Graphics: 2
ENGR 126 | Engineering Computer Graphics | 2

Mathematics: 16
MATH 115 | Calculus I | 4
MATH 116 | Calculus II | 4
MATH 215 | Calculus III | 4
MATH 228 | Diff Eqns with Linear Algebra | 4

Chemistry I and II: 8
CHEM 134 | General Chemistry IA | 4
CHEM 144 | Gen Chemistry IB | 4
CHEM 136 | General Chemistry IIA | 4
CHEM 146 | General Chemistry IIB | 4

Biology: 8
BIOL 103 | Anatomy and Physiology I | 4
BIOL 140 | Intro Molec & Cellular Biology | 4

Physics I and II: 8
PHYS 150 | General Physics I | 4
PHYS 151 | General Physics II | 4

Engineering Basic Courses: 17
ENGR 250 | Principles of Eng Materials | 3
ENGR 216 | Computer Meth for Engineers | 2
ME 230 | Thermodynamics | 4

ME 260 | Design Stress Analyses | 4
ECE 305 | Intro to Electrical Eng | 4

Professional Requirements (61)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beng/ME Core</td>
<td>50</td>
</tr>
<tr>
<td>13 courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 325</td>
<td>Thermal Fluid Sciences I</td>
<td>4</td>
</tr>
<tr>
<td>BENG 351</td>
<td>Bio-Sensors &amp; Instrumentation</td>
<td>4</td>
</tr>
<tr>
<td>BENG 364</td>
<td>Prob&amp;Stat in Bioengineering</td>
<td>3</td>
</tr>
<tr>
<td>BENG 370</td>
<td>Biomechanics I</td>
<td>4</td>
</tr>
<tr>
<td>BENG 375</td>
<td>Biomaterial Tissue Engrg</td>
<td>4</td>
</tr>
<tr>
<td>BENG 381</td>
<td>Bioprocessing</td>
<td>4</td>
</tr>
<tr>
<td>ME 345</td>
<td>Engineering Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>ME 375</td>
<td>Thermal Fluid Sciences II</td>
<td>4</td>
</tr>
<tr>
<td>ME 379</td>
<td>Thermal-Fluids Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ME 381</td>
<td>Manufacturing Processes I</td>
<td>4</td>
</tr>
<tr>
<td>ME 3601</td>
<td>Des and Analy of Mach Elem</td>
<td>4</td>
</tr>
<tr>
<td>ME 442</td>
<td>Control Syst Any &amp; Design</td>
<td>4</td>
</tr>
<tr>
<td>ME 4681</td>
<td>ME/BENG Dual Senior Design</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives: 11
11 credits of upper-level technical elective courses from lists below. At least one course must be a design elective course

Design Electives: 3-4
at least one:
BENG 426 | Fundamentals of Drug Delivery                            | 3            |
BENG 451 | Microfluidics                                            | 3            |
BENG 460 | Nanobiosystems Engineering                               | 3            |
BENG 470 | Advanced Biomechanics                                    | 3            |
BENG 481 | Biomimetics                                               | 3            |
IMSE 4675 | Six Sigma & Stat Proc Improv                             | 4            |
IMSE 4425 | Human Factors and Ergonomics                             | 4            |
ME 4191 | Structural Mech & Design                                  | 4            |
ME 4201 | Design of Turbomachinery                                  | 4            |
ME 4202 | Design Turbo. and Wind Gen.                              | 4            |
ME 4361 | Design of HVAC Systems                                    | 4            |
ME 4471 | Solar Energy Sys Analy&Design                             | 4            |
ME 460 | Design for Manufacturing                                  | 3            |
ME 469 | Senior Design II                                          | 1-4          |
ME 472 | Prin & Appl of Mechatronic Sys                           | 4            |
ME 483 | Dsgn Cons in Poly and Comp Mat                            | 3            |
ME 493 | Advanced Vehicle Energy Sys                               | 3            |
ME 490 | Directed Design Project                                   | 1-3          |
ME 493 | Exper Hnrs Dir Dsgn                                       | 1            |

Upper-Level Tech Electives
BENG 410 | Bioinformatics                                           | 3            |
BENG 425 | Transport in Biosystems                                  | 3            |
BENG 475 | Regenerative Eng                                         | 3            |
CHEM 437 | Nano-Biotechnology                                       | 3            |
ENGR 350 | Nanoscience and Nanotechnology                           | 4            |
Computer and Information Science/Cybersecurity

Students with an interest in both areas can pursue a dual B.S. program in Computer and Information Science and Cybersecurity and thus can earn two B.S. degrees at the same time:

- B.S. degree in Computer and Information Science (Information Systems Concentration)
- B.S. degree in Cybersecurity and Information Assurance (Cybersecurity and Privacy or Digital Forensics Concentration)

The dual degree program requires specified coursework that equals a minimum of 138 total credits.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a dual B.S. degree in Computer and Information Science and Cybersecurity and Information Assurance.

General Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td>PHIL 240</td>
<td>Ethics (Also fulfills 3 credits of DDC Humanities and the Arts)</td>
<td></td>
</tr>
</tbody>
</table>

Social and Behavioral Analysis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (Fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization (Fulfills 3 credits DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>CRJ 200</td>
<td>Intro to Criminal Justice (Fulfills 3 credits DDC Social and Behavioral Analysis)</td>
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</tr>
</tbody>
</table>

Intersections

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel (Fulfills 3 credits DDC Intersections)</td>
<td></td>
</tr>
</tbody>
</table>
ENGR 400  Appl Business Tech for Engr (Fulfills 3 credits DDC Intersections)  
or ENT 400  Entrepreneurial Thinking&Behav

Mathematics and Cognates

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mathematics and Statistics</td>
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<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Laboratory Science Sequence

Two courses, 8 credits, in a sequence from:

- BIOL 130  Intro Org and Environ Biology  
- & BIOL 140  and Intro Molec & Cellular Biology

or

- CHEM 134  General Chemistry IA  
- or CHEM 144  Gen Chemistry IB  
- & CHEM 136  and General Chemistry IIA

or

- GEOL 118  Physical Geology  
- & GEOL 218  and Historical Geology

or

- PHYS 125  Introductory Physics I  
- & PHYS 126  and Introductory Physics II

or

- PHYS 150  General Physics I  
- & PHYS 151  and General Physics II

CIS-CIA Courses and Electives (85)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic Requirements</td>
<td></td>
</tr>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>CIS 150</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 310</td>
<td>Computer Org and Assembly Lang</td>
<td>4</td>
</tr>
<tr>
<td>CIS 350</td>
<td>Data Struc and Algorithm Anlys</td>
<td>4</td>
</tr>
<tr>
<td>CIS 375</td>
<td>Software Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 421</td>
<td>Database Mgmt Systems</td>
<td>4</td>
</tr>
<tr>
<td>CIS 427</td>
<td>Comp Networks and Dis Process</td>
<td>4</td>
</tr>
<tr>
<td>CIS 435</td>
<td>Web Technology</td>
<td>3</td>
</tr>
<tr>
<td>CIS 450</td>
<td>Operating Systems</td>
<td>4</td>
</tr>
</tbody>
</table>

Choose either the CIA-DF Concentration or the CIA-CP Concentration

CIA-DF Concentration REQUIRED  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CIS 387</td>
<td>Digital Forensics I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 468</td>
<td>Criminology</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 475</td>
<td>Digital Evidence</td>
<td>3</td>
</tr>
</tbody>
</table>

CIA-CP Concentration REQUIRED  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
<td>3</td>
</tr>
<tr>
<td>CIS 446</td>
<td>Wireless &amp; Mobi Comp Securirty</td>
<td>3</td>
</tr>
<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 4851</td>
<td>Data Security and Privacy</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 409</td>
<td>Intel and Homeland Security</td>
<td>3</td>
</tr>
<tr>
<td>ECE 427</td>
<td>Digi Content Protec</td>
<td>4</td>
</tr>
<tr>
<td>MATH 396</td>
<td>Introduction to Cryptography</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional CIS-INSY Requirements  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 3005</td>
<td>Intro to Operations Research</td>
<td>4</td>
</tr>
<tr>
<td>CIS 425</td>
<td>Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>CIS 476</td>
<td>Soft Arch &amp; Design Patterns</td>
<td>3</td>
</tr>
</tbody>
</table>

Take one COURSE FROM THE following:

- CIS 296  Java Programming  
- or CIS 297  Intro to C Sharp  
- or CIS 298  Intro to Python

Capstone

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 4951</td>
<td>Design Seminar I</td>
<td>2</td>
</tr>
<tr>
<td>CIS 4952</td>
<td>Design Seminar II</td>
<td>2</td>
</tr>
</tbody>
</table>

Electives (Approved list of CIS-CIA Electives)  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 285</td>
<td>Software Engineering Tools</td>
<td>3</td>
</tr>
<tr>
<td>CIS 316</td>
<td>Prac. Comp. Sec.</td>
<td>3</td>
</tr>
<tr>
<td>CIS 376</td>
<td>Software Engineering II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 381</td>
<td>Industrial Robots</td>
<td>4</td>
</tr>
<tr>
<td>CIS 387</td>
<td>Digital Forensics I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 436</td>
<td>Mobile App Des &amp; Impl</td>
<td>3</td>
</tr>
<tr>
<td>CIS 437</td>
<td>Advanced Networking</td>
<td>3</td>
</tr>
<tr>
<td>CIS 447</td>
<td>Intro Computr &amp; Ntwrk Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 467</td>
<td>Digital Forensics II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 487</td>
<td>Computer Game Design &amp; Implem</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
<td>1</td>
</tr>
</tbody>
</table>

1 Select electives not used to fulfill the requirements of your concentration.

Computer and Information Science/ Data Science

Students with an interest in both areas can pursue a dual B.S. program in Computer and Information Science and Data Science and thus can earn two B.S. degrees at the same time:

- B.S. degree in Computer and Information Science (Computer Science Concentration)
- B.S. degree in Data Science

The dual degree program requires specified coursework that equals a minimum of 139 total credits.
Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a dual B.S. degree in Computer and Information Science and Data Science.

General Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (Fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
</tbody>
</table>

Sciences, Cognates, and Applications (36)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>8</td>
</tr>
<tr>
<td>&amp; BIOL 140</td>
<td>and Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CHEM 136</td>
<td>and General Chemistry IIA</td>
<td></td>
</tr>
<tr>
<td>GEOL 118/218</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 126</td>
<td>and Introductory Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 151</td>
<td>and General Physics II</td>
<td></td>
</tr>
</tbody>
</table>

Four additional science credit hours from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 130</td>
<td>Introduction to Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>ASTR 131</td>
<td>Introductory Astronomy Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Intro Org and Environ Biology</td>
<td>0,4</td>
</tr>
<tr>
<td>or BIOL 140</td>
<td>and Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 144</td>
<td>and Gen Chemistry IB</td>
<td></td>
</tr>
<tr>
<td>CHEM 136</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 225</td>
<td>Organic Chemistry I</td>
<td>2-3</td>
</tr>
<tr>
<td>or CHEM 226</td>
<td>and Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>or CHEM 227</td>
<td>and Organic Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 118</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>or GEOL 218</td>
<td>and Historical Geology</td>
<td></td>
</tr>
<tr>
<td>PHYS 125</td>
<td>Introductory Physics I</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS 150</td>
<td>and General Physics I</td>
<td></td>
</tr>
<tr>
<td>PHYS 126</td>
<td>Introductory Physics II</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS 151</td>
<td>and General Physics II</td>
<td></td>
</tr>
</tbody>
</table>

Education, Health, & Human Services

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHS 470</td>
<td>Information Science and Ethics</td>
<td>3</td>
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</tbody>
</table>

Business

Take one of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 400</td>
<td>Appl Business Tech for Engr</td>
<td>3</td>
</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking &amp; Behav</td>
<td>3</td>
</tr>
</tbody>
</table>

Data Science Applications

Take 18 credit hours from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM 404</td>
<td>Dynamical Systems</td>
<td>3</td>
</tr>
<tr>
<td>CCM 472</td>
<td>Intro to Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CCM 473</td>
<td>Matrix Computation</td>
<td>3</td>
</tr>
<tr>
<td>CIS 376</td>
<td>Software Engineering II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 405</td>
<td>Algorithm Analysis &amp; Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 423</td>
<td>Dec Support and Exp Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 451</td>
<td>Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 452</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 481</td>
<td>Computational Learning</td>
<td>3</td>
</tr>
</tbody>
</table>
CIS and DS Courses and Electives (80)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take one of the following two groups of courses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 1501</td>
<td>CS I for Data Scientists</td>
<td>4</td>
</tr>
<tr>
<td>CIS 2001</td>
<td>CS II for Data Scientists</td>
<td>4</td>
</tr>
<tr>
<td>CIS 296</td>
<td>Java Programming</td>
<td>3</td>
</tr>
<tr>
<td>Group 2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 150</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 298</td>
<td>Intro to Python</td>
<td>3</td>
</tr>
<tr>
<td>&amp;</td>
<td>CIS 275</td>
<td>Discrete Structures I</td>
</tr>
<tr>
<td>CIS 350</td>
<td>Data Struct and Algorithm Anlys</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Additional Data Science Requirements</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>ECE 3100</td>
<td>Data Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 3200</td>
<td>Data Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 422</td>
<td>Massive Data Management</td>
<td>4</td>
</tr>
<tr>
<td>STAT 305</td>
<td>Intro. to Data Science</td>
<td>3</td>
</tr>
<tr>
<td>STAT 430</td>
<td>Applied Regression Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Additional CIS Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 306</td>
<td>Discrete Structures II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 310</td>
<td>Computer Org and Assembly Lang</td>
<td>4</td>
</tr>
<tr>
<td>CIS 375</td>
<td>Software Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 479</td>
<td>Intro to Artificial Intel</td>
<td>3</td>
</tr>
<tr>
<td>CIS 427</td>
<td>Comp Networks and Dis Process</td>
<td>4</td>
</tr>
<tr>
<td>CIS 450</td>
<td>Operating Systems</td>
<td>4</td>
</tr>
<tr>
<td>Capstone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 4981</td>
<td>Design Seminar for CIS-DS I</td>
<td>2</td>
</tr>
<tr>
<td>CIS 4982</td>
<td>Design Seminar for CIS-DS II</td>
<td>2</td>
</tr>
</tbody>
</table>

1 Credit for only one of the following two courses: CHEM 144 or CHEM 134, PHYS 125 and PHYS 150, and PHYS 126 and PHYS 151

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundationalal Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements
In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a dual BSE degree in Electrical and Computer Engineering from UM-Dearborn.

Basic PREP Requirements (37)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
</tbody>
</table>
Choose one of these four courses: 3-4
- ECE 319 Electromagnetic Compatibility 4
- ECE 414 Electronic Systems Design 4
- ECE 415 Power Electronics 4
- ECE 4361 Electric Machines and Drives 4
- ECE 435 Intro to Mobil/Smrt Dev & Tech 4
- ECE 4432 Renewable Elec Pwr Sys 4
- ENGR 492 Exper Honors Directed Research 1
- ENGR 493 Exper Hnrs Dir Dsgn 1

Choose 3-4 credits from the following courses:
- ECE 413 Intro to VLSI Design 3
- ECE 4881 Introduction to Robot Vision 3
- ENGR 399 Experiential Honors Prof. Prac 1
- ENGR 492 Exper Honors Directed Research 1
- ENGR 493 Exper Hnrs Dir Dsgn 1

Industrial and Systems/Manufacturing Engineering

Students with an interest in both areas can pursue a dual B.S.E. program in Industrial Systems and Manufacturing Engineering and thus can earn two B.S.E. degrees at the same time:

- B.S.E. degree in Industrial and Systems Engineering
- B.S.E. degree in Manufacturing Engineering

The dual degree program requires specified coursework that equals a minimum of 143 total credits.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)
Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements
A candidate for the dual Bachelor of Science in Engineering (B.S.E. in Industrial and Systems Engineering and B.S.E. in Manufacturing Engineering) is required to pursue scholastic quality and to complete satisfactorily the following program of study.

Basic PREP Requirements (54)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (Also fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional 3 credit course required in areas above (DDC) or in IMSE Electives, to reach 143 credits.

Intro to Engineering | 4
ENGR 100 | Intro to Eng and Computers | 2
ENGR 126 | Engineering Computer Graphics | 2

Mathematics & Science | 32
MATH 115 | Calculus I | 4
MATH 116 | Calculus II | 4
MATH 215 | Calculus III | 4
MATH 228 | Diff Eqns with Linear Algebra | 4
CHEM 134 | General Chemistry I A | 4
or CHEM 144 | Gen Chemistry IB | 4
CHEM 136 | General Chemistry IIB | 4
or CHEM 146 | General Chemistry IIB | 4
or BIOL 140 | Intro Molec & Cellular Biology | 4
PHYS 150 | General Physics I | 4
PHYS 151 | General Physics II | 4

Basic Requirements | 18
ME 230 | Thermodynamics | 4
IMSE 255 | Computer Programming for Eng | 3
ENGR 250 | Principles of Eng Materials | 3
ME 260 | Design Stress Analyses | 4
or ME 265 | Applied Mechanics | 4
ECE 305 | Intro to Electrical Eng | 4

Professional Requirements (65)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 3005</td>
<td>Intro to Operations Research</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 382</td>
<td>Manufacturing Processes</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 421</td>
<td>Eng Economy and Dec Anlys</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 440</td>
<td>Applied stat models in engin</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4425</td>
<td>Human Factors and Ergonomics</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4585</td>
<td>Simulation in Systems Design</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4675</td>
<td>Six Sigma &amp; Stat Proc Improv</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4745</td>
<td>Facilities Design</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4795</td>
<td>Prod, Inven Control &amp; Lean Mfg</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4825</td>
<td>Industrial Controls</td>
<td>4</td>
</tr>
<tr>
<td>or ME 442</td>
<td>Control Syst Anly and Design</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4835</td>
<td>Comp.-Aided Prcs Design &amp; Mfg</td>
<td>4</td>
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MFGE Elective | 3-4
Choose one course from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 4815</td>
<td>Manufacturing Process II</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 488</td>
<td>Metal Forming Processes</td>
<td>3</td>
</tr>
<tr>
<td>ME 484</td>
<td>Manufacturing Poly Comp Matl</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 350</td>
<td>Nanoscience and Nanotechnology</td>
<td>4</td>
</tr>
</tbody>
</table>

Capstone | 4
IMSE 4951 | Design Project I                                           | 2            |
IMSE 4952 | Design Project II                                          | 2            |

Tech & Professional Electives | 12-13

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 351</td>
<td>Data Struc &amp; Algorithm Anlysis</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 381</td>
<td>Industrial Robots</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 453</td>
<td>Data Comm/Distributed Process</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 456</td>
<td>Intro to Data Base Systems</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4545</td>
<td>Information Systems Design</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 486</td>
<td>Design for Assembly &amp; Mfg</td>
<td>4</td>
</tr>
<tr>
<td>ACC 298</td>
<td>Financial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>ACC 299</td>
<td>Managerial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>OB 354</td>
<td>Behavior in Organization</td>
<td>4</td>
</tr>
<tr>
<td>OB 401</td>
<td>Management Skills Development</td>
<td>4</td>
</tr>
<tr>
<td>OB 402</td>
<td>Organizational Change &amp; Devlp</td>
<td>4</td>
</tr>
<tr>
<td>LE 452</td>
<td>The Legal Environment of Bus</td>
<td>4</td>
</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking &amp; Behav</td>
<td>4</td>
</tr>
<tr>
<td>MKT 352</td>
<td>Mktg Principles and Policies</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 360</td>
<td>Des Inovtn. Proc. Meth &amp; Prct</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
<td>4</td>
</tr>
</tbody>
</table>
Manufacturing/Mechanical Engineering

Students with an interest in both areas can pursue a dual B.S.E. program in Manufacturing and Mechanical Engineering and thus can earn two B.S.E. degrees at the same time:

- B.S.E. degree in Manufacturing Engineering
- B.S.E. degree in Mechanical Engineering

The dual degree program requires specified coursework that equals a minimum of 143 total credits.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course


- Lecture/Lab Science Course
- Additional Behavioral Analysis Course

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GCE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gce)

Major Requirements

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a dual BSE degree in Manufacturing and Mechanical Engineering from UM-Dearborn.

Basic PREP Requirements (53)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Fulfills 3 credits of DDC Written and Oral Communication)</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (Fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td>4</td>
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Intro to Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 126</td>
<td>Engineering Computer Graphics</td>
<td>2</td>
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</table>

Mathematics and Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CHEM 136</td>
<td>and General Chemistry IIA</td>
<td>8</td>
</tr>
<tr>
<td>or CHEM 144</td>
<td>Gen Chemistry IB</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CHEM 146</td>
<td>and General Chemistry IIB</td>
<td>8</td>
</tr>
</tbody>
</table>

Basic Engineering Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 216</td>
<td>Computer Meth for Engineers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 250</td>
<td>Principles of Eng Materials</td>
<td>2</td>
</tr>
<tr>
<td>ME 230</td>
<td>Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>ME 260</td>
<td>Design Stress Analyses</td>
<td>4</td>
</tr>
<tr>
<td>ECE 305</td>
<td>Intro to Electrical Eng</td>
<td>4</td>
</tr>
</tbody>
</table>

Professional Requirements (69)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

ME Requirements (8 courses)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 325</td>
<td>Thermal Fluid Sciences I</td>
<td>4</td>
</tr>
<tr>
<td>ME 345</td>
<td>Engineering Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>ME 349</td>
<td>Instrument &amp; Measuremt Systems</td>
<td>3</td>
</tr>
<tr>
<td>ME 3601</td>
<td>Des and Analy of Mach Elem</td>
<td>4</td>
</tr>
<tr>
<td>ME 364</td>
<td>Prob, Stats, and Rel in Mach D</td>
<td>3</td>
</tr>
<tr>
<td>ME 375</td>
<td>Thermal Fluid Sciences II</td>
<td>4</td>
</tr>
<tr>
<td>ME 379</td>
<td>Thermal-Fluids Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ME 381</td>
<td>Manufacturing Processes I</td>
<td>4</td>
</tr>
<tr>
<td>or IMSE 382</td>
<td>Manufacturing Processes</td>
<td>4</td>
</tr>
<tr>
<td>ME 442</td>
<td>Control Syst Anly and Design</td>
<td>4</td>
</tr>
</tbody>
</table>
digital signals (microprocessors, digital signal processing algorithms and hardware), and ensure safety and performance of complex systems (electromagnetic compatibility).

A unique feature of the Bachelor of Science Engineering in Electrical Engineering program is the opportunity for students to work concurrently to earn a second degree in Computer Engineering by taking an additional 16 credit hours of courses. In this case, a student can earn two Bachelor's Degrees in just 141 credit hours. Some employment listings require a computer engineering background while others call for specialization in electrical engineering. A student who pursues the dual degree option is qualified for both types of positions and therefore has a distinct advantage in securing employment.

The Bachelor of Science Engineering in Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org (http://www.abet.org/)

Program Educational Objectives

The graduates who receive the Bachelor of Science Engineering in Electrical Engineering from the University of Michigan-Dearborn are expected to achieve within a few years of graduation the high professional, ethical, and societal goals demonstrated by accomplishing one or more of the objectives described below.

1. Achieve professional growth in an engineering position in regional and national industries. Growth can be evidenced by promotions and appointment in the workplace (management positions, technical specialization), entrepreneurial activities, and consulting activities.
2. Success in advanced engineering studies evidenced by enrollment in graduate courses, completion of graduate degree programs, presentations and publications at professional events, and awards or licenses associated with advanced studies.
3. Realization of impactful achievements in societal roles demonstrated by attainment of community leadership roles, mentoring activities, civic outreach service, and active roles in professional societies.

Program Outcomes

The Bachelor of Science Engineering in Electrical Engineering program is designed to demonstrate that graduates of the program have:

a. an ability to apply knowledge of mathematics, science, and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs
d. an ability to work cooperatively on multi-disciplinary projects
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility
g. proficiency in oral and written communications
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a clear understanding that lifelong learning is essential for sustained professional development
j. a knowledge of contemporary issues and its impact on the engineering profession
Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

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Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

• Lecture/Lab Science Course
• Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a BSE degree in Electrical Engineering from UM-Dearborn.

Basic Preparation for Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (ECON 201 or 202 also fulfill 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
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<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td></td>
</tr>
<tr>
<td>ENT 400</td>
<td>Entrepreneurial Thinking&amp;Behav (Also fulfills 3 credits of DDC Intersections)</td>
<td></td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>2</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 134</td>
<td>General Chemistry IA</td>
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</tr>
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<td>or CHEM 144</td>
<td>Gen Chemistry IB</td>
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</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
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<td>PHYS 151</td>
<td>General Physics II</td>
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Upper level physics (choose one):

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<tbody>
<tr>
<td>PHYS 305</td>
<td>Contemporary Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 314</td>
<td>Computational Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 320</td>
<td>Environmental Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 403</td>
<td>Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 405</td>
<td>Optics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 406</td>
<td>Thermal and Statistical Physic</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 416</td>
<td>Biological Physics</td>
<td>4</td>
</tr>
<tr>
<td>ECE 276</td>
<td>Discrete Math in Computer Engr (If chosen, 1 credit from course will apply to Approved Electives)</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 27</td>
<td>Discrete Math Meth Comptr Engr</td>
<td></td>
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</table>

Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ECE 210</td>
<td>Circuits</td>
<td>4</td>
</tr>
<tr>
<td>ECE 270</td>
<td>Computer Methods in ECE I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 273</td>
<td>Digital Systems</td>
<td>4</td>
</tr>
<tr>
<td>ECE 311</td>
<td>Electronic Circuits I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3731</td>
<td>Microproc and Embedded Sys</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3171</td>
<td>Analog &amp; Discrete Sig &amp; Sys</td>
<td>4</td>
</tr>
<tr>
<td>ECE 385</td>
<td>Elec Materials and Devices</td>
<td>3</td>
</tr>
<tr>
<td>or ECE 3851</td>
<td>Intro Elect Materials &amp; Dev</td>
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<tr>
<td>ECE 450</td>
<td>Analog and Digital Comm Sys</td>
<td>4</td>
</tr>
<tr>
<td>ECE 460</td>
<td>Automatic Control Systems</td>
<td>4</td>
</tr>
<tr>
<td>ECE 480</td>
<td>Intro to Dig Signal Processing</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4951</td>
<td>Sys Design and Microcontrollers</td>
<td>3</td>
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<tr>
<td>ECE 4981</td>
<td>Electrical Engineering Des I</td>
<td>2</td>
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<tr>
<td>ECE 4983</td>
<td>Electrical Engin Design II</td>
<td>2</td>
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</table>

Professional Electives

Select two courses from the following list:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ECE 319</td>
<td>Electromagnetic Compatibility</td>
<td>7-8</td>
</tr>
<tr>
<td>ECE 413</td>
<td>Intro to VLSI Design</td>
<td></td>
</tr>
<tr>
<td>ECE 414</td>
<td>Electronic Systems Design</td>
<td></td>
</tr>
<tr>
<td>ECE 415</td>
<td>Power Electronics</td>
<td></td>
</tr>
</tbody>
</table>
ECE 435  Intro to Mobil/Smrt Dev & Tech
ECE 4361  Electric Machines and Drives
ECE 443  Intr to Electric Power Systems
or ECE 4432  Renewable Elec Pwr Sys
ECE 4881  Introduction to Robot Vision
ENGR 492  Exper Honors Directed Research
ENGR 493  Exper Hnrs Dir Dsgn

Approved Technical Electives
Select 8-9 credit hours from approved list.

ECE 319  Electromagnetic Compatibility
ECE 321  Electromagnetic Fields/Waves
ECE 370  Adv Soft Techn in Comp Engr
ECE 375  Intro to Comp Architecture
ECE 413  Intro to VLSI Design
ECE 414  Electronic Systems Design
ECE 415  Power Electronics
ECE 428  Cloud Computing
ECE 433  Intr to Multimedia Technolgies
ECE 435  Intr to Mobil/Smrt Dev & Tech
ECE 4361  Electric Machines and Drives
ECE 438  Web Engr. Prin & Tech
ECE 443  Intr to Electric Power Systems
ECE 4432  Renewable Elec Pwr Sys
ECE 446  Electromechanical Energy Conv
ECE 454  Intr to Modern Wireless Comm
ECE 471  Comp Networks/Data Comm
ECE 473  Embedded System Design
ECE 475  Comp Hardware Org/Design
ECE 478  Operating Systems
ECE 4881  Introduction to Robot Vision
ME 230  Thermodynamics
ME 260  Design Stress Analyses
ME 265  Applied Mechanics
ENGR 350  Nanoscience and Nanotechnology
ENGR 399  Experiential Honors Prof. Prac
ENGR 492  Exper Honors Directed Research
ENGR 493  Exper Hnrs Dir Dsgn
IMSE 421  Eng Economy and Dec Anlys

Professional and Technical Electives must total a minimum of 16 credits.

ECE 270  Computer Methods in ECE I  4 Credit Hours
Covers structured and object-oriented computer programming concepts in the context of the C/C++ programming language and engineering applications. Four lecture hours per week with programming assignments.
Prerequisite(s): ENGR 100 and MATH 115*
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 273  Digital Systems  4 Credit Hours
Introduction to digital logic. Topics include numbers and coding systems; Boolean algebra with applications to logic systems; Karnaugh and Quine-McCluskey minimization; combinatorial logic design; flip-flops; sequential network design; and design of digital logic circuits. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): MATH 115*
Corequisite(s): ECE 273L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 276  Discrete Math in Computer Engr  4 Credit Hours
An introduction to fundamental concepts of discrete mathematics for computer engineering. Topics will be chosen from set theory, partially ordered sets, lattices, Boolean algebra, semi-groups, rings, graphical representation of algebraic systems, graphs, and directed graphs. Applications in various areas of computer engineering will be discussed.
Prerequisite(s): (MATH 116 or Mathematics Placement with a score of 215)

ECE 299  Internship/Co-Op  1 Credit Hour
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 300  Signals and Systems  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Fourier analysis of continuous time signals and systems. Laplace transforms with applications to linear system analysis. Introduction to computer software for solving problems involving signals and systems. Three lecture hours and three recitation hours per week.
Prerequisite(s): ECE 210 and (MATH 217* or MATH 227*) and MATH 216

ECE 305  Intro to Electrical Eng  4 Credit Hours
Introduction to electrical and electronic circuits, machinery, and instrumentation. Topics include Kirchoff's Laws, Thevenin and Norton theorems, sinusoidal and transient circuit analysis, numerical methods, solid state electronics, motors and generators, measuring instruments. Three lecture hours and one three-hour laboratory analysis. Not open to ECE students.
Prerequisite(s): PHYS 151 and (MATH 205 or MATH 215) and (MATH 217* or MATH 227*)
Corequisite(s): ECE 305L
Restriction(s):
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is Electrical Engineering
ECE 3100  Data Science I  4 Credit Hours
This course provides an overview of the mathematical techniques and computer tools needed in the field of data science. The important types of problems addressed in the field of data science are rigorously formulated and analyzed, including regression, pattern recognition and classification, time series prediction, and clustering. Effective mathematical and computational solution methodologies are discussed, including exploratory data analysis, statistical methods, and machine learning. At the end of the course, the student will have an analytic and computational toolkit with which they can solve real problems and "tell a story" with data. (F)
Prerequisite(s): (CIS 1501 or CIS 150 or ECE 270) and (MATH 217 or MATH 227 or MATH 228) and (STAT 325* or IMSE 317* or BENG 364*)
Restriction(s):
Can enroll if Level is Undergraduate

ECE 311  Electronic Circuits I  4 Credit Hours
Terminal characteristics and biasing of semiconductor diodes, bipolar and field-effect transistors, operational amplifiers. Rectifiers, amplifiers, and logic. Design projects. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 210 and (CHEM 134 or CHEM 144) and (COMP 270 or COMP 106 or COMP 220 or COMP 280 or Composition Placement Score with a score of 40)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 314  Filter Design  3 Credit Hours
Review of filter descriptions, transfer functions, and frequency response characteristics; first and second order passive and active filters; biquad circuits; filter transformations. Butterworth, Chebyshev, and Elliptic filters; OPAMP realization of active filters; sensitivity analysis of active circuits. Three lecture hours per week.
Prerequisite(s): ECE 311 and ECE 317

ECE 316  Computer Electronics  3 Credit Hours
Design of selected electronic circuits such as signal conditioning amplifiers. Switching and digital logic circuits, using FET and BJT devices, A/D and D/A converters. Two-hour lecture and one three-hour lab per week. (YR).
Prerequisite(s): ECE 210 and ECE 273 and (COMP 270* or COMP 106* or Composition Placement Score with a score of 40 or COMP 220*)

ECE 317  Electronic Signals and Systems  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Laplace transforms with applications to linear system analysis. Fourier series Fourier Transform and Discrete Fourier Transform, Frequency response, Filter design. Four lecture hours per week.
Prerequisite(s): MATH 216 and (MATH 217* or MATH 227*) and ECE 311*
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 3171  Analog & Discrete Sig & Sys  4 Credit Hours
Signals and systems representation and classification. Impulse response and convolution integral. Laplace and Z transforms with applications to linear system analysis. Fourier series Fourier Transform and Discrete Fourier Transform, Frequency response, Filter design. Four lecture hours per week.
Prerequisite(s): (MATH 228 or MATH 216) and (MATH 217* or MATH 227*) and ECE 311*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ECE 319  Electromagnetic Compatibility  4 Credit Hours
Introduction, cabling, grounding, balancing and filtering, passive components, shielding, digital circuit noise and PCB layout, radiation, ESD regulations, demos, experiments, lab projects and guest lectures. Three Lecture hours and one three-hour laboratory per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 321  Electromagnetic Fields/Waves  3 Credit Hours
Vector analysis; static electric field; steady electric currents; static magnetic fields; time-varying fields and Maxwell's equations; plane electromagnetic waves. Three lecture hours per week.
Prerequisite(s): ECE 311*

ECE 329  Intro to Computer Music  4 Credit Hours
This course will introduce students to methods and technologies of computer music. The basics of digital audio will be covered, including sampling, quantization, and compression standards. Various analysis tools will be covered, including the Fourier transform and windowing techniques. Mathematical models of physical instruments will be introduced. Various sound synthesis strategies will be introduced: wave tables, additive synthesis, subtractive synthesis, frequency modulation, and granular synthesis.
Prerequisite(s): MATH 105
Restriction(s):
Can enroll if Class is Junior or Senior

ECE 347  Applied Dynamics  4 Credit Hours
Introduction to rigid, multi-body dynamics tailored to the analysis and design of linkage-based robotic systems. Three dimensional kinematics, Eulerian angles, general motion of rigid bodies subjected to various forcing functions. Matrix methods, numeral and software-based problem solving. Project required. Four lecture hours per week.
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227) or MATH 228
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 351  Bio-Sensors & Instrumentation  4 Credit Hours
The course covers measurements in biological materials using a variety of sensor technologies along with electronic instrumentation design and use. Safety and FDA requirements are also presented.
Prerequisite(s): ECE 305 and (ENGR 216 or ECE 270) and MATH 216 and BIOL 103 and BIOL 140
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science or Arts, Sciences, and Letters
ECE 3641  Robotics I  4 Credit Hours
Design, construction, and testing of field robotic systems. Focus on electronics, instrumentation, and machine elements. Particular attention to modeling dynamic systems, measuring and controlling their behavior, and making decisions about future courses of action. Examples include industrial robots, service robots, mobile robots, and medical robots. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): (ECE 3731 or ECE 372) and ECE 347

ECE 370  Adv Soft Techn in Comp Engr  4 Credit Hours
Advanced concepts and techniques of modular object oriented and structured programming; representative real-world computer engineering applications including data structures, search and sorting. A term project is required. Four lecture hours per week. (F,W,S).
Prerequisite(s): ECE 270 and ECE 273*

ECE 371  Information Structures  3 Credit Hours
Fundamentals of computer data structures. Introduction to abstract data types. Characteristics and implementation of structured data types including arrays, stacks, queues, linked lists, generalized lists, trees, and graphs. Algorithms and applications of data structures in sorting and searching. Considerations of algorithm efficiency and complexity. Engineering applications and design. Three lecture hours per week.
Prerequisite(s): ECE 370 or ECE 274

ECE 372  Intro to Microprocessors  4 Credit Hours
Introduction to operation, interfacing, and applications of microcomputers and microprocessor-based systems. Assembly language programming, interrupts and interfacing. Three lecture hours and one three-hour laboratory per week.
Prerequisite(s): (ECE 270 and ECE 273) or CIS 310 and (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40)

ECE 3731  Microproc and Embedded Sys  4 Credit Hours
This course is an introduction to the operation, interfacing, and applications of microprocessor based systems, and real-time embedded system design. Topics include: microprocessor architecture, embedded C programming, real-time programming. Final project required. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): (ECE 270 and ECE 273) or CIS 310
Corequisite(s): ECE 3731L
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 375  Intro to Comp Architecture  4 Credit Hours
Introduction to architecture of mini- and mainframe computers. CPU, memory, and I/O characteristics. Introduction to parallel architectures and hardware design languages. Case studies of popular computer systems and design considerations. A design project is required. Three lecture hours and one laboratory hour per week.
Prerequisite(s): ECE 270 and ECE 273 and (ECE 276* or MATH 276*) and (ECE 372* or ECE 3731*)
Corequisite(s): ECE 375L
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 3801  Intro to Signals and Systems  3 Credit Hours
Prerequisite(s): ECE 210 and MATH 216

ECE 385  Elec Materials and Devices  3 Credit Hours
Introduction to properties of conductors, semi-conductors, and insulators. Definitions of stress and strain. Description of the mechanical behavior of solids. Characterization of selected materials; circuit models for resistors, capacitors, inductors, junction and field-effect transistors, etc. Three lecture hours per week.
Prerequisite(s): ECE 311* and (CHEM 144 or CHEM 134)

ECE 387  Digital Forensics I  4 Credit Hours
This course takes a detailed, hands-on approach to study the procedures and techniques used to identify, extract, validate, document and preserve electronic evidence. Students completing this course will be familiar with the core computer science theory and practical skills necessary to perform basic computer forensic investigations, understand the role of technology in investigating computer-based crime, and be prepared to deal with investigative bodies at a basic level.
Prerequisite(s): (ECE 270 or CIS 200) and (ECE 370* or ECE 372* or CIS 310*)

ECE 388  Selected Topics in ECE  1 to 3 Credit Hours
Special topics in ECE according to student's interest and availability of instructors and equipment.

ECE 390  Internship/Co-op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Junior or Senior
ECE 411 Electronics II 4 Credit Hours
Review of solid state devices and their physical properties, introduction to the state of art devices, design of operational amplifiers, oscillators, switching and digital circuits. A project will be required. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): ECE 301 and ECE 311

ECE 413 Intro to VLSI Design 3 Credit Hours
Introduction to digital systems and VLSI, CMOS fabrication, layout and CMOS integrated circuits, basic principles of MOSFET theory, CMOS logic circuits, subsystem design, Architecture design and HDL, CLSI chip design, advanced topics, laboratory consist of a series of design projects. Three lecture hours per week.
Prerequisite(s): ECE 273 and ECE 311

ECE 414 Electronic Systems Design 4 Credit Hours
Review of solid state device characteristics and circuit analysis. Design of selected electronic circuits such as operational amplifiers, power amplifiers, power supplies, oscillators, switching and digital circuits to further illustrate analysis and design of representative electronic circuits using classical and computer-aided design techniques. Four lecture/ laboratory per week.
Prerequisite(s): ECE 311 and ECE 270*

ECE 415 Power Electronics 4 Credit Hours
Introduction to power electronic circuit analysis and design. Power electronic circuits, power converters, power semiconductors. Time domain analysis emphasized. A design project is required. Four lecture/ laboratory hours per week.
Prerequisite(s): (ECE 317 or ECE 3171) and ECE 385

ECE 420 EMC Measurement and Testing 3 Credit Hours
Introduction to EMC measurements, RF measurement fundamentals, EM waves, radiation mechanisms, measurement and measurement systems, screened rooms, open field test sites, practical measurements, conducted emission measurements, radiated emission measurements, radiated immunity, conducted immunity and electrostatic discharge. Projects will be assigned. (YR).
Prerequisite(s): ECE 319

ECE 426 Multimedia Forensics 4 Credit Hours
The objective of this course is to introduce current state-of-the-art in digital multimedia editing, its impacts on multimedia tampering, and multimedia forensics techniques to uncover inconsistencies due to tampering. This course will cover existing digital multimedia tampering techniques such as copy-move, cut-and-paste, etc. and digital multimedia tamper detection techniques. The course will also cover covert communication methods such as steganography and covert channel detection method steganalysis. This course will cover the limitations of existing state-of-the-art in multimedia forensics. Hands-on experience will be provided in various aspects of multimedia tampering and analysis through the numerous assignments and projects. Three lecture hours per week and one three-hour laboratory per week. (F)
Prerequisite(s): (ECE 387 or CIS 387) or CIS 447 or ECE 317
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 427 Digi Content Protec 4 Credit Hours
The objective of this course is to introduce current techniques information security in general and multimedia security in particular. This course will cover existing information hiding techniques such as digital watermarking, steganography, and fingerprinting. The course will also cover conventional digital content protection methods such as cryptography. This course will cover the pros and cons of conventional and non-conventional digital content protection methods and associated design issues to give the student hands-on experience in various aspects of information security and analysis through the various assignments and projects. (W)
Prerequisite(s): (ECE 387 or CIS 387) or CIS 447 or ECE 317
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 428 Cloud Computing 3 Credit Hours
Cloud computing represents the emerging Internet-based services/ platforms with elastic and scalable computation powers operating at costs associated with service. Topics may include advanced web technologies (AJAX and Mashup), distributed computing models and technologies (Hadoop and MapReduce), Infrastructure-as-a-Service (IaaS), Software as a Service (SaaS), Platform-as-a-Service (PaaS), virtualization, parallelization, security/privacy, and other issues in cloud computing. This course will also explore the current challenges facing cloud computing. Course work will include homework assignments, presentations and a term project. Students cannot take both ECE 428 and ECE 528 for degree credit. Three lecture hours per week.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 431 Electrical Eng Design 4 Credit Hours
The course is conducted as a guided project design course with the class divided into teams and assigned a specific design project. Periodic progress reports are submitted during the term. A final written report and an oral presentation including demonstration are required at the end of the term. Cost analysis, evaluation of design alternatives and application of engineering principles are emphasized. Two scheduled contact hours and six hours open laboratories per week.
Prerequisite(s): ECE 311 and ECE 373 and ECE 493*

ECE 432 Electrical Eng Design 6 Credit Hours
The course is conducted as a guided project design course over a two- semester period with the class divided into teams and assigned a specific design project. Periodic progress reports are submitted during the term. A final written report and an oral presentation including demonstration are required at the end of the term. Cost analysis, evaluation of design alternatives and application of engineering principles are emphasized. Two scheduled contact hours and six hours open laboratories per week.
Prerequisite(s): ECE 311 and ECE 372 and ECE 493*
ECE 433  Intr to Multimedia Technolgies  4 Credit Hours
This course will introduce students to basic terminology and methods of multimedia. Basic concepts of digital audio will be reviewed, including frequency, sampling, and popular compression schemes. Concepts of digital images will be introduced, such as resolution, color theory, and compression formats. Basic concepts of digital video and animation will be introduced. Relevant web technologies will be reviewed. Four lecture hours per week.
Prerequisite(s): ECE 311 or ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ECE 434  Machine Learning in Engin  4 Credit Hours
Introduce fundamental theories and basic techniques in machine learning with an emphasis on engineering applications. Topics include learning concepts, search algorithms, neural networks, fuzzy learning, paradigms for problem solving using machine learning. (F, W).
Prerequisite(s): ECE 370
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate

ECE 435  Intro to Mobil/Smrt Dev & Tech  4 Credit Hours
This class will introduce students to the technology used in mobile/ smart devices and mobile communication networks. Various hardware and software aspects will be introduced, with particular emphasis on the constraints intrinsic to such systems. Students will get an overview of various mobile operating systems and how to develop software for mobile devices. Four lecture hours per week.
Prerequisite(s): ECE 372 or ECE 3731
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Software Engineering, Computer Engineering

ECE 436  Elec Machines & Hybrid Drives  4 Credit Hours
This is an introductory course on electric machines and drive systems and their application in EV, HEV, PHEV and FCV powertrains. The objectives are to familiarize the students with the basic concepts of electromechanical energy conversion and electric drive systems. Students are expected to be able to analyze and design electric drive systems for automotive, industrial, and residential applications. The topics covered in this course include DC machines, induction machines, permanent magnet synchronous machines, and switched reluctance motors and drives. Case studies in automotive applications such as electric and hybrid drivetrains, industrial and residential electric variable speed drive systems, will be discussed. Students cannot take both ECE 436 and ECE 4361 for credit. Four lecture hours per week.
Prerequisite(s): ECE 311
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering

ECE 437  Intro to Automotive Cybersec  4 Credit Hours
The objective of this course is to introduce modern vehicles, in-vehicle communication networks and protocols such as CAN, LIN, and so on, threat models, diagnostics, and penetration testing. This course will cover existing in-vehicle communication protocols and associated vulnerabilities. Students are expected to learn penetration testing for automotive systems. This course will cover the limitations of existing state-of-the-art in multimedia forensics. Simulation tools, labs and projects will be used to provide hands-on learning experience in various aspects of in-vehicle communication. (W,YR).
Prerequisite(s): ECE 3731* or ECE 372*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 443  Intr to Electric Power Systems  3 Credit Hours
This course will introduce students to basic methods of electric power systems. Topics include AC circuits, phasors, complex power and complex impedance, transformers, per unit system, transmissions lines, power flow, economic dispatch, real and reactive power control, symmetric and unsymmetric faults, transient stability, relaying and protection. Three lecture hours per week.
Prerequisite(s): ECE 317 or ECE 3171
ECE 4431  Vehicular Pwr Sys & Loads  4 Credit Hours
This is an introductory course on power systems and load analysis with focus on automotive applications. The objectives are to familiarize the students with the basic principles and concepts of vehicular power systems and loads. Students are expected to be able to analyze and design basic vehicular power systems. The topics covered in this course include an overview of power systems, vehicular power system architecture, DC and AC power grid in vehicular systems, power system stability, reliability, reactive power control, load flow analysis, short circuit analysis, and vehicular power system protection. Four lecture hours per week.
Prerequisite(s): ECE 317 or ECE 3171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ECE 4432  Renewable Elec Pwr Sys  4 Credit Hours
This course is an introduction to traditional power grids as well as renewable electric power systems. This course covers long-distance transmission of electric power with emphasis on admittance and impedance modeling of components and systems, complex power-flow studies, symmetrical and unsymmetrical fault calculations, economic operation of large-scale generation and transmission systems, an overview of emerging renewable energy technologies (e.g. wind and solar) and the impact of grid integration of renewable energy on power grids. Students cannot take both ECE 4431 and ECE 4432 for credit. Four lecture hours per week.
Prerequisite(s): ECE 3171
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering

ECE 446  Electromechanical Energy Conv  4 Credit Hours
Introduces fundamental concepts and specifications of electromechanical energy conversion: AC and DC machines drive, electric and magnetic storage and transfer, transformer, and performance analysis of AC and DC machines. The topics include principles of energy conversion, permanent magnet synchronous machines, induction machines, and DC machines. The lab projects for the course will focus on modeling, evaluation, and practice of AC and DC machine drives based on computer simulation and DSP based experiments; transient and dynamic analysis; linearization and small signal analysis of machines. Four lecture/laboratory hours per week.
Prerequisite(s): ECE 311 and (ECE 317* or ECE 3171*)

ECE 450  Analog and Digital Comm Sys  4 Credit Hours
Topics include introduction to communication systems, base band communications, sampling theorem, amplitude and frequency modulation system design, statistical analysis of error and performance, digital modulation of analogy signals, digital communication and digital modulation schemes, random processes and applications in digital communications, and noise analysis, optimal receiver. Four lecture hours per week.
Prerequisite(s): (ECE 317 or ECE 3171) and IMSE 317

ECE 451  Signal Detection  3 Credit Hours
Introduction to signal detection, parameter estimation and information extraction theory and its application to communication systems. Subject areas covered within the context of a digital environment are decision theory, detection and estimation of known and random signals in noise, adaptive recursive digital filtering, optimal linear filtering and pattern recognition. Three lecture hours.
Prerequisite(s): ECE 450

ECE 452  Probabilistic Meth/Signal Aly  3 Credit Hours
Introduction to probability, random processes, correlation functions, and spectral density. Response of linear systems to random inputs. Applications in the field of communications.
Prerequisite(s): ECE 300

ECE 454  Intr to Modern Wireless Comm  3 Credit Hours
This course provides an introduction to the fundamentals of modern wireless communication. The focus of this course will be on the (i) basic signal propagation issues and channel impairments, (ii) modulation schemes and bandwidth/power trade-offs, and (iii) overcoming channel impairment using equalizers, diversity and channel coding. Additionally case studies will examine current wireless LANs and cellular system. Three Hours of lecture per week.
Prerequisite(s): ECE 450 or ECE 471
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 456  Intro to Electro-optics  3 Credit Hours
Laser sources, detectors, imaging systems, optical signal processing, illumination and image acquisition, triangulation, and fiber optics. Three one-hour lecture periods.
Prerequisite(s): ECE 311 and ECE 321

ECE 460  Automatic Control Systems  4 Credit Hours
Modeling and response of dynamic systems. Transfer functions, poles and zeros and their significance to transient and steady state response of feedback systems. Analysis of stability of closed-loop systems. Steady state errors and transient performance of closed-loop systems. Design of feedback control systems by root locus techniques and by frequency domain methods. Laboratory projects include modeling, controller design, controller realization, system performance evaluation, and simulation studies. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 317 or ECE 3171
Corequisite(s): ECE 460L

ECE 464  Robotics  4 Credit Hours
Prerequisite(s): (ECE 300 or ECE 365) and ME 265
ECE 4641  Robotics II  4 Credit Hours
This is the second of a two-course sequence introducing foundational theory and applications of robotics engineering. The topics of this course include embedded computing, locomotion, localization, dead reckoning, inertial sensors and perception, navigation, multi-robotics systems, and human-robot interaction, and complex response processes. Three lecture hours and one three hour laboratory per week.
Prerequisite(s): ECE 3641 and ECE 370 and IMSE 317
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
ECE 465  Digital Control Design and Imp  4 Credit Hours
Discrete model of a continuous-time system. Differential equations and Z-transforms. Similarities and differences between discrete-time and continuous-time models. Translation of analog designs to digital designs. State-space methods including state feedback and observers. Hardware limitations and implementation issues. Four lecture/laboratory hours per week.
Prerequisite(s): ECE 460
ECE 467  Digital Forensics II  4 Credit Hours
This course is a continuation of Digital Forensics I and will focus on Internet Forensics. Students will examine in-depth concepts in Internet evidence collection and preservation, as well as applications of contemporary commercial forensic investigative software.
Prerequisite(s): (ECE 387 or CIS 387) and (ECE 471* or CIS 427*)
Restriction(s):
Cannot enroll if Class is Freshman
Cannot enroll if Level is Rackham or Graduate
Cannot enroll if College is Business
ECE 470  Computer Int and Data Comm  4 Credit Hours
Hardware and software techniques used in interfacing between computers and other computers or devices. Analog and digital techniques. Parallel and serial communications. Popular communication protocols. Error detection and correction. Lab project involves interfacing and communicating with a microprocessor.
Prerequisite(s): ECE 372
ECE 471  Comp Networks/Data Comm  4 Credit Hours
Hardware and software techniques used in interfacing between computers and other computers or devices. Data transmission techniques and protocols. Introduction to popular local area network protocols. Forward Error Control Techniques and Data Compression. Introduction to wireless communications with focus on major challenges and obstacles and the cellular phone infrastructure. Term projects involve developing a data link layer protocol for interfacing and communication with microprocessors. Four lecture hours per week.
Prerequisite(s): (ECE 372 or ECE 3731) and (IMSE 317 or BENG 364)
ECE 473  Embedded System Design  4 Credit Hours
This course studies the issues dealing with real-time embedded system design. Topics include: microprocessor architecture, assembly language, real-time programming, space and time limitations, relations between ANSI C Compiler output and assembly language, compiler linkers and using a system development package for C programming. (F,W,S).
Prerequisite(s): ECE 372 or ECE 3731
Corequisite(s): ECE 473L
ECE 474  Compiler Design  3 Credit Hours
Principles of language compilation. Introduction to formal languages. Lexical analysis, top-down and bottom-up parsing, code generation and optimization. Error handling and symbol table management. Run-time storage management. Programming language design. Introduction to compiler-writing tools. A software design project is required. Three lecture hours per week.
Prerequisite(s): ECE 370
ECE 475  Comp Hardware Org/Design  4 Credit Hours
Design methodology, performance analysis using probability and statistic methods, hardwired and microprogramming in CPU design, hardware design languages and memory design. Advanced concepts in computer architecture. A design project is required. Three lecture hours per week and one three-hour laboratory per week.
Prerequisite(s): ECE 375
ECE 476  Intro to Parallel Processing  3 Credit Hours
Advances in computer architecture, parallel structures, performance evaluation, memory bandwidth considerations, processing bandwidth, communication and synchronization. A design project is required. Three lecture hours per week.
Prerequisite(s): ECE 375
ECE 478  Operating Systems  4 Credit Hours
Introduction to computer operating systems. Process management, threads, CPU scheduling, memory management, process synchronization, file systems and I/O devices. Selected advanced topics, e.g., distributed systems, deadlock, I/O, job scheduling, and performance analysis using queueing models, will be introduced. Case studies of modern operating systems. A design project is required. Four lecture hours per week.
Prerequisite(s): ECE 370 and IMSE 317
ECE 479  Artificial Intelligence  3 Credit Hours
Basic concepts and methodology of artificial intelligence from a computer engineering perspective. Emphasis is placed on the knowledge representations, reasoning and algorithms for the design and implementation of intelligent systems. Introduction to an AI language and representative intelligence systems. A design project is required. Three lecture hours per week.
Prerequisite(s): ECE 370
ECE 480  Intro to Dig Signal Processing  4 Credit Hours
Prerequisite(s): (ECE 317 or ECE 3171) and (MATH 217 or MATH 227 or MATH 228)
Corequisite(s): ECE 480L
Restriction(s):
Can enroll if College is Engineering and Computer Science
ECE 488  Introduction to Machine Vision  4 Credit Hours
Applications to machine vision. Representative topics are: optics and lighting, sensor characteristics, image acquisition, image analysis, segmentation, connectivity, shape description, hardware for vision applications, software considerations, applications including automatic inspection and metrology. Open lab and project will be required.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Senior
ECE 4881  Introduction to Robot Vision  3 Credit Hours
This course introduces the theories and modern technologies in robot vision. Topics include sensors, image analysis, region and segmentation, object recognition, stereo vision, optical flow, color image, object tracking and applications. Students cannot receive credit for both ECE 4881 and ECE 588. Three lecture hours per week.
Prerequisite(s): ECE 270
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Cannot enroll if Major is

ECE 490  Selected Topics in Elec Engin  1 to 3 Credit Hours
Advanced or applied topics in electrical engineering offered according to student’s interest and availability of instructors and equipment. Lecture hours, laboratory, and/or computation period to be arranged.

ECE 491  Directed Studies  1 to 4 Credit Hours
Student in consultation with a faculty advisor will prepare a proposal in sufficient detail describing a subject topic to be studied. The proposal will be subject to approval by the department. A formal written and oral evaluation of the work performed are required for successful completion. Lecture hours, laboratory, and/or computation periods to be arranged.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 492  Directed Research  1 to 4 Credit Hours
Student, in consultation with a faculty advisor will prepare a proposal in sufficient detail describing a research problem to be studied. The proposal will be subject to approval by the department. A formal written and oral evaluation of the research performed are required for successful completion. Lecture hours, laboratory, and/or computation period to be arranged.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 493  Design Factors in Eng  2 Credit Hours
This course is comprised of a series of lectures on the subject of design. It will promote awareness of such factors as literature review, performance specifications, design considerations, product liability, standards and ethics, professional registration codes, patents and copyrights, packaging, documentation and report preparation. Two lecture hours.
Restriction(s):
Can enroll if Class is Senior or Graduate

ECE 495  Micro Systems Design  4 Credit Hours
Course content includes discussion and laboratory experience on a number of interfacing topics (timing, serial and parallel communication, ADC/DAC, control loop) and the preparation of a major report on a design topic approved by the course instructor. Team design projects may involve either software or hardware, or both. Two lecture hours and two three-hour laboratories per week.
Prerequisite(s): ECE 373 and (ECE 311 or ECE 316)

ECE 4951  Sys Design and Microcontrollers  3 Credit Hours
Techniques for interfacing actuators and sensors to computers with emphasis on the use of a variety of microprocessors and a broad range of sensors. Topics include introduction to small microprocessors such as PIC16, PIC18, small systems such as opic, basicx as well as using a PC as a controller. Control of motors and other actuators using opto-isolators and discrete electronics, use of H-bridges. Interfacing sensors that provide different encoding data, such as analog signals, digital communication using I2C protocol, handshake I/O, pulse width encoding. Interfacing to wireless communication using RF or IR. Includes laboratory experiments, individual midterm project and a final team project. Three lecture hours per week. (F,W)
Prerequisite(s): ECE 311 and (ECE 372 or ECE 3731)

ECE 498  Senior Engineering Design  3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.
Prerequisite(s): (ECE 311 or ECE 316) and ECE 373

ECE 4981  Electrical Engineering Des I  2 Credit Hours
This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or COMP 280) and (ECE 317 or ECE 3171) and (ECE 372 or ECE 3731) and (ECE 414 or ECE 415 or ECE 450 or ECE 460 or ECE 480 or ECE 4951)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4982  Computer Engineering Des I  2 Credit Hours
This course is conducted as a guided project design course over a two semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.
Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or COMP 280) and (ECE 372 or ECE 3731) and ECE 375 and (ECE 471 or ECE 473 or ECE 475 or ECE 478)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
ECE 4983   Electrical Engin Design II   2 Credit Hours
Second Semester ? Electrical Engineering Design This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.

Prerequisite(s): ECE 4981
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior
Can enroll if College is Engineering and Computer Science

ECE 4984   Computer Engin Design II   2 Credit Hours
Second Semester Computer Engineering Design This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.

Prerequisite(s): ECE 4982
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior
Can enroll if College is Engineering and Computer Science

ECE 4985   Electrical Engineering Design   3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.

Prerequisite(s): (COMP 270 or COMP 106 or COMP 220 or Composition Placement Score with a score of 40) and (ECE 317 or ECE 3171) and ECE 372 and (ECE 414 or ECE 415 or ECE 450 or ECE 460 or ECE 480 or ECE 4951)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior
Can enroll if College is Engineering and Computer Science

ECE 4986   Computer Engineering Design   3 Credit Hours
This course is conducted as a guided project design course over a two-semester period, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation, and application of demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of lectures on design issues will be presented in the first semester.

Prerequisite(s): (COMP 270 or Composition Placement Score with a score of 40 or COMP 106 or COMP 220) and (ECE 317 or ECE 3171) and ECE 372 and ECE 375 and (ECE 471 or ECE 473 or ECE 478 or ECE 475)
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior

ECE 4987   Robotics Engineering Design I   2 Credit Hours
This course is conducted as a guided project design course over a two-course sequence, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized. A series of tutorials will be presented to provide student teams with insight into important system level considerations and trade offs.

Prerequisite(s): ECE 311 and ECE 3171 and (ECE 372 or ECE 3731) and ECE 3641 and (ECE 460 or ECE 4641)
Restriction(s):
Cannot enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 4988   Robotics Engineering Design II   2 Credit Hours
Second semester Robotics Engineering Design: This course is conducted as a guided project design course over a two-course sequence, with the class divided into teams, each assigned a specific design project. Periodic progress reports, a final written report, an oral presentation and project demonstration are required. Cost analysis, societal impact, safety issues, evaluation of design alternatives and application of engineering principles will be emphasized.

Prerequisite(s): ECE 4987
Restriction(s):
Cannot enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ECE 499   Internship/Co-op   1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.

Restriction(s):
Cannot enroll if Class is Senior

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Engineering Mathematics
(Concurrent Degree)

The Bachelor of Science Engineering in Engineering Mathematics program at UM-Dearborn provides students an opportunity to expand their knowledge in the field of applied mathematics, which is essential in modern engineering. By combining the tools and techniques learned in the engineering mathematics program with those learned in their engineering disciplines, students become more proficient in the application of mathematical reasoning to formulate and solve a wide range of contemporary engineering problems. The combined mathematics and engineering education gained though the program enables the graduates to successfully pursue professional careers in industry, research and development, and elsewhere.

The Engineering Mathematics degree is a concurrent Bachelor of Science in Engineering (B.S.E.) degree in Engineering Mathematics (EMATH) that can be pursued by undergraduate students majoring in Bioengineering,
Computer Engineering, Electrical Engineering, Industrial and Systems Engineering, Manufacturing Engineering, Mechanical Engineering, or Robotics Engineering. This makes it possible for a student majoring in one of the engineering disciplines to earn two degrees at the same time: a Bachelor of Science Engineering degree in their principal engineering major and a concurrent Bachelor of Science Engineering degree in Engineering Mathematics. Both degrees must be earned at the same time.

**Educational Objectives**

The coursework in the concurrent Bachelor of Science Engineering in Engineering Mathematics prepares graduates to:

1. Be able to develop innovative mathematical solutions to complex engineering problems.
2. Engage in continuous learning to advance their professional careers.

**Program Outcomes**

1. The ability to apply mathematical tools to model and solve engineering/applied mathematics problems.
2. The ability to use techniques and modern mathematical tools to solve engineering/applied mathematics problems.
3. The ability to communicate mathematical ideas.

**Major Requirements**

The Engineering Mathematics degree requires a minimum of 15 credit hours of course work in advanced mathematics beyond the 16 credits of mathematics already required in the degree program of the student's principal engineering major.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 462</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
</tbody>
</table>

**Choose 3 course from one of the following two areas** 9

**Area 1 Numerical and Statistical Analysis**

- MATH 420/ ECE 555  Stochastic Processes 1
- MATH 425  Mathematical Statistics
- MATH 472  Intro to Numerical Analysis
- MATH 473  Matrix Computation

**Area 2: Modern and Classical Applied Mathematics**

- MATH 404  Dynamical Systems
- MATH 454  Fourier and Boundary
- MATH 455  Func of a Complex Var with App
- MATH 458  Introduction to Wavelets
- MATH 516  Fin Elemnt Meth for Diff Equat 1

**Mathematics Elective**

Take one additional course from Area (1) or Area (2), OR one of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 3100</td>
<td>Data Science I</td>
<td></td>
</tr>
<tr>
<td>CIS 3200</td>
<td>Data Science II</td>
<td></td>
</tr>
<tr>
<td>ECE 567</td>
<td>Nonlinear Control Systems 1</td>
<td></td>
</tr>
<tr>
<td>IMSE 505</td>
<td>Optimization 1</td>
<td></td>
</tr>
<tr>
<td>IMSE 511</td>
<td>Design and Analysis of Exp 1</td>
<td></td>
</tr>
<tr>
<td>MATH 523</td>
<td>Linear Algebra w/Applications 1</td>
<td></td>
</tr>
<tr>
<td>MATH 514</td>
<td>Fin Diff Meth for Diff Equat 1</td>
<td></td>
</tr>
</tbody>
</table>

1 Permission of graduate instructor required. Graduate tuition assessment applies.

**Industrial and Systems Engineering**

Industrial and systems engineering is concerned with the study and design of integrated systems of people, materials, equipment and their interaction with the surrounding environment. Historically, this field developed in the manufacturing industries where industrial engineers applied their engineering knowledge and management techniques to design and efficiently operate industrial and business systems. But the advent of the modern information technology enabled industrial engineers to apply their quantitative methods and organizational skills to a multitude of large-scale systems in addition to industrial systems. Today, industrial and systems engineers are being called upon, with increasing frequency, to design and improve the performance of systems in a wide spectrum of fields such as service, energy, transportation, finance, and health care. Thus, their scope is not limited to tackling industrial problems alone, but extends to finding solutions for the endless variety of problems of modern industrial society.

The field of study bridges engineering knowledge, management principles, physical and social sciences, and the life sciences. Simply put, it stresses the scientific and technological approach to the design, development, and the optimal operation of both large-scale and small-scale systems. The industrial and systems engineer is a versatile expert whose talents are vigorously sought, and will be for a long time to come, by various sectors of society.

**Undergraduate Degree Program**

The Bachelor of Science Engineering in Industrial & Systems Engineering provides first a strong basis in the foundations of engineering: natural and physical sciences, mathematics, socioeconomic-cultural background, the behavioral sciences and the basic engineering sciences which begin the emphasis on problem solving. Then, the program develops the intermediate bases on which industrial systems and other systems engineering work is founded. This includes studies in production and operations management, lean concepts, quality engineering methods, system modeling, simulation and optimization, organization and decision theory, and human factors engineering. Contemporary operations research methods are progressively developed and applied through systems-design case studies ending with a capstone design experience.

The Bachelor of Science Engineering in Industrial and Systems Engineering is accredited by the Engineering Accreditation Commission of ABET, abet.org (http://www.abet.org/)

An unusual opportunity is available to obtain considerable practical expertise in the student's specialty for those who elect the internship option.

Students who do well in their undergraduate program are encouraged to consider graduate work and may take some of their electives in preparation for graduate study. Information and assistance regarding fellowships and assistantships for graduate study may be obtained from the department chairperson.
Industrial and Systems Engineering majors may also pursue a dual Bachelor of Science Engineering in Manufacturing Engineering and thus can earn two Bachelor of Science Engineering degrees at the same time:

- Bachelor of Science Engineering in Industrial and Systems Engineering
- Bachelor of Science Engineering in Manufacturing Engineering.

This requires a minimum of 15 credits of additional and separate courses beyond the 128 credits required for a Bachelor of Science Engineering in Industrial and Systems Engineering alone. Both degrees must be earned at the same time.

**Educational Objectives of the BSE (Industrial and Systems Engineering) Program**

Consistent with providing a strong academic foundation in the field of Industrial and Systems Engineering, the program educational objectives for our graduates are:

- To remain gainfully employed in Industrial and Systems Engineering related fields,
- To continue to develop professionally, and
- To serve in leadership roles.

**Program Outcomes**

To achieve the educational objectives, the graduates of the program will have:

1. an ability to apply knowledge of mathematics, sciences and engineering
2. an ability to design and conduct experiments, as well as to analyze and interpret data
3. an ability to design a system, component or process to meet desired needs
4. an ability to function on multidisciplinary teams
5. an ability to identify, formulate and solve engineering problems
6. an understanding of professional and ethical responsibility
7. an ability to communicate effectively
8. the broad education necessary to understand the impact of engineering solutions in a global and societal context
9. a recognition of the need for, and an ability to, engage in lifelong learning and graduate studies
10. a knowledge of contemporary issues
11. an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Major Requirements**

A candidate for the degree Bachelor of Science in Engineering (Industrial and Systems Engineering) is required to pursue scholastic quality and to complete satisfactorily the following program of study:

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a BSE degree in Industrial and Systems Engineering from UM-Dearborn.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin. Macroeconomics (ECON 201 or 202 also fulfills 3 credits of DDC Social and Behavioral Analysis)</td>
<td></td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 126</td>
<td>Engineering Computer Graphics</td>
<td>2</td>
</tr>
</tbody>
</table>
Select 12-13 credits from the following:

**Focus Area Electives**
- IMSE 4952
- IMSE 4951
- Capstone
- IMSE 4745
- IMSE 4585
- IMSE 3005

**ISE Core**
- IMSE 255  Computer Programming for Eng  3
- ENGR 250  Principles of Eng Materials  3
- ME 265  Applied Mechanics  4
- or ME 260  Design Stress Analyses  4

**ECE**
- ECE 305  Intro to Electrical Eng  4
- IMSE 317  Eng Probability and Statistics  3
- IMSE 382  Manufacturing Processes  4
- IMSE 421  Eng Economy and Dec Anlys  3
- IMSE 440  Applied stat models in engin  4
- IMSE 4425  Human Factors and Ergonomics  4
- IMSE 4675  Six Sigma & Stat Proc Improv  4
- IMSE 4795  Prod, Inven Control & Lean Mfg  4

**ISE Core**
- IMSE 3005  Intro to Operations Research  4
- IMSE 4585  Simulation in Systems Design  4
- IMSE 4745  Facilities Design  4

**Capstone**
- IMSE 4951  Design Project I  2
- IMSE 4952  Design Project II  2

**Focus Area Electives**
Select 12-13 credits from the following: 12-13
- ACC 298  Financial Accounting
- ACC 299  Managerial Accounting
- ENGR 360  Des Inovtn: Proc, Meth & Prct
- ENGR 399  Experiential Honors Prof. Prac
- ENGR 492  Exper Hnrs Directed Research
- ENGR 493  Exper Hnrs Dir Dsgn
- ENT 400  Entrepreneurial Thinking&Behav
- IMSE 351  Data Struc & Algorithm Anlysis
- IMSE 381  Industrial Robots
- IMSE 453  Data Comm/Distributed Process
- IMSE 456  Intro to Data Base Systems
- IMSE 4545  Information Systems Design
- IMSE 4815  Manufacturing Process II
- IMSE 4825  Industrial Controls
- IMSE 4835  Comp.-Aided Prcs Desgn & Mfg
- IMSE 486  Design for Assembly & Mfg
- LE 452  The Legal Environment of Bus
- MKT 352  Mktg Principles and Policies
- OB 354  Behavior in Organization
- OB 401  Management Skills Development
- OB 402  Organizational Change & Devlp

**Free Electives**
Select 3-4 hours  3-4
Focus Area and Free Electives must total minimum of 16 credits

### Dual Degree in Manufacturing Engineering
Please see the requirements for the BSE, Industrial and Systems Engineering/Manufacturing Engineering in the Dual Degrees section of this catalog.

**IMSE 255  Computer Programming for Eng  3 Credit Hours**
Intermediate topics in computer programming: arrays, files, structured data types, pointers, functions. Overview of digital computer hardware and system software components: machine architecture, operating systems, computer networks, data security, and performance evaluation. **Prerequisite(s):** ENGR 100 or MATH 105 or Mathematics Placement with a score of 113

**IMSE 299  Internship/ Co-Op  1 Credit Hour**
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).

**Restriction(s):**
Can enroll if Class is Junior or Senior or Graduate

**IMSE 3005  Intro to Operations Research  4 Credit Hours**
This course introduces some basic techniques or operations research used in decision making and system performance evaluation in both deterministic and probabilistic environments. Topics in linear programming, especially the simplex method with duality theory and sensitivity analysis is included. Other topics include integer programming, deterministic dynamic programming, network problems, PERT-CPM, discrete-time and continuous-time Markov chain models of random processes, queuing theory and applications. (YR) **Prerequisite(s):** (MATH 217 or MATH 227) and IMSE 317*

**IMSE 317  Eng Probability and Statistics  3 Credit Hours**
Set theory, combinatorial analysis, probability and axioms, random variables, continuous and discrete distribution functions, expectations, Chebychev’s inequality, weak law of large numbers, central limit theorem, sampling statistics and distributions, point and interval estimation and linear regression. Three hours lecture.

**Prerequisite(s):** MATH 116 or Mathematics Placement with a score of 215 or MATH 114

**IMSE 334  Org of Hospital Systems  3 Credit Hours**
The fundamental concepts of organizational behavior are explored. The interrelationships among personnel in an organization, and the functions and responsibilities of individuals are discussed. Topics studied include decision-making theory, organizational authority and adjunct responsibility, leadership and supervision. Particular emphasis is placed upon hospitals and the health care industry. Lectures are supplemented with actual case studies from the health care industry in which the student has the opportunity to apply problem-solving techniques to true-to-life situations. Three hours lecture.

**Restriction(s):**
Can enroll if Class is Junior or Senior or Graduate
IMSE 350  Data Structures  4 Credit Hours
This course focuses on data design and algorithm designs. Data design topics include object-oriented discussions of hashing, advanced tree structures, graphs and sets. Algorithm design topics include the greedy, divide-and-conquer, dynamic programming, backtracking, and branch-and-bound techniques. A significant discussion of algorithm complexity theory, including time and space trade-off and elementary computability theory is included.
Prerequisite(s): MATH 115 and (CIS 200 or IMSE 200) and CIS 275

IMSE 351  Data Struct & Algorithm Analysis  3 Credit Hours
Object-oriented design, programming, and analysis techniques review; structured programming concepts; data structures; algorithm design and analysis; lists, stacks, and queues; heaps, sorting, trees, graphs, and algorithm development utilizing modern languages, such as C++, Java.
Prerequisite(s): IMSE 255 or CIS 150 or IMSE 150 or CCM 150

IMSE 352  Intro to File Processing  3 Credit Hours
File processing environment, storage media, sequential, random and indexed sequential files, inverted lists, multilists, tree structures, file control systems. Three hours lecture.
Prerequisite(s): IMSE 200 and CIS 175

IMSE 356  Real Time Computing  3 Credit Hours
Introduction to real time computing concepts applicable to discrete systems. Fundamentals of real time hardware, operating systems and C programming language. Selected coverage of instrumentation, input/output modes, data conversion, single task and multitask programming. Two hours of lecture and three hours of laboratory per week.
Prerequisite(s): IMSE 150 or IMSE 255

IMSE 381  Industrial Robots  4 Credit Hours
The course introduces students in engineering and computer science to fundamentals of robotics technology, programming and their applications in industrial environment. The emphasis will be on robotics anatomy and configurations, robotocs kinematics, end effectors, use of sensors in robotics, robotics programming, design of robot workcell, robotics applications to production problems, cost justifications and robotics safety, rather than on the extensive theory of robotics. Three-hour lecture and three-hour laboratory per week.
Prerequisite(s): MATH 115
Restriction(s):
Can enroll if Class is Junior or Senior

IMSE 382  Manufacturing Processes  4 Credit Hours
This course introduces the students to the fundamentals and principles of manufacturing processes for engineering materials. It seeks to transfer an understanding of the application of principles of engineering materials and their influence on manufacturing processes. Topics covered include structure and manufacturing properties of metals, casting, heat treatments, bulk deformation processes, sheet metal working processes, processing of polymers and composites, surfaces and coating, powder metallurgy, machining and joining. Case studies of design for manufacturing and measurement of product quality; economical aspects and cost considerations in manufacturing systems will be studied. Three lecture hours and three laboratory hours.
Prerequisite(s): ENGR 250 and (ME 265 or ME 260)
Corequisite(s): IMSE 382L

IMSE 390  Selected Topics I  3 Credit Hours
Study of topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.

IMSE 391  Selected Topics II  3 Credit Hours
Study of Advanced topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.
IMSE 440  Applied stat models in engin  3 Credit Hours
Full Course Title: Applied statistical models in engineering The course provides students with considerable experience to flexibly work with Linear Regression Models and Design of Experiments. With the growth of automated systems, data analysis became an essential tool in engineering. The first part of the course introduces students to Simple Linear Models, Multiple Linear Models, Model Evaluation, Model Diagnosis, Analysis of Variance, Residual Analysis, and Model Selection. The second part of the course introduces students to Design of Experiments and commonly used designs such as the Completely Randomized Design, Randomized Complete Block Design, and Latin Squares Design. The course also provides the students with experience handling data for engineering applications via in-class activities and assignments. Student teams complete a major data analysis project to answer a set of engineering questions and challenges. (YR)
Prerequisite(s): IMSE 317 or BENG 364 or ME 364
Restriction(s): Can enroll if College is Engineering and Computer Science

IMSE 4425  Human Factors and Ergonomics  4 Credit Hours
The course integrates the elements of traditional methods of engineering and time-motion studies with ergonomics and human factors concepts. Methods improvement, work measurement, and work design, applied to manufacturing and service industries, so as to increase productivity and improve worker health and safety. The topics covered include: problem solving tools; operation analysis; time-motion analysis; work sampling; manual and cognitive work design; workplace, equipment, tool and work environment design; allowances; and lean manufacturing. Lectures and laboratory. (YR)
Prerequisite(s): IMSE 317 or BENG 364
Restriction(s): Can enroll if Level is Undergraduate

IMSE 450  Operating Systems  4 Credit Hours
Introduction to computer operating systems. Process management, CPU scheduling, memory management, file systems and I/O devices. Advanced topics, e.g., multiprogramming and multitasking, virtual memory, deadlock, I/O job scheduling, and performance analysis using queueing models, will be introduced. Case studies of modern operating systems. A design project is required.
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 276 and ECE 370) and IMSE 317

IMSE 451  Computer Graphics  3 Credit Hours
The mathematics, algorithms and data structures of computer graphics programming in 2 or 3 dimensions. Applications of computer graphics in Engineering Science and Data Processing.
Prerequisite(s): IMSE 351 or CIS 351 or CIS 350 or IMSE 350 or CCM 350

IMSE 453  Data Comm/Distributed Process  4 Credit Hours
Study of the technical and management aspects of computing networks and distributed systems. Topics include network architectures (ISO/OSI, TCP/IP, ATM), communication hardware (transmission media, network adapters, switches), encoding, framing, error detection and correction, reliable transmission, data link control and LAN technology, internetworking, routing/congestion control, network design/management.
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 351 or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317

IMSE 4545  Information Systems Design  4 Credit Hours
Role of information systems in organizations. Economic factors and social impact of information systems. Phases to design an information system: systems objectives and criteria establishment, fact investigation and analysis, feasibility study, output-input design, processing design, file and database design, safety and reliability considerations, detailed systems description, programming specifications, testing analysis and design skills will be assigned. A series of cases will be used in developing an information system. SQL will be used to develop data tables and access information. Three lecture hours and one three-hour laboratory.
Prerequisite(s): IMSE 255 or CIS 205
Restriction(s): Can enroll if Level is Undergraduate

IMSE 456  Intro to Data Base Systems  4 Credit Hours
An introduction to database system concepts and techniques. Topics covered include database environments, ER modeling, relational data model, object-oriented database, object-relational database, database design theory and methodologies, database languages, query processing and optimization, concurrency control, database recovery, and database security.
Prerequisite(s): CIS 350 or CIS 350A or IMSE 351 or (ECE 370 and MATH 276)

IMSE 457  Compiler Design  3 Credit Hours
The design and construction of compilers and programming systems. Lexical scan; parsing techniques; code generation and optimization. Runtime organization; storage allocation. Applications of formal language theory in compiler design. Translator writing systems; XPL. Three one-hour lectures.
Prerequisite(s): IMSE 350 or CIS 350 or CCM 350

IMSE 4585  Simulation in Systems Design  4 Credit Hours
This course introduces digital simulation as a design and modeling tool. The fundamental techniques of constructing a simulation model and evaluating the results are studied. A computer simulation software is used (such as ARENA, ProModel, Witness, Simul8). Topics include random number and random variate generation, input and output data analysis, design of experiments and optimization of simulated systems, verification and validation, discrete and continuous simulation models, comparison of simulation modeling software, and applications of simulation in different industries. Students are asked to select problems of interest and present final project reports. Four lecture hours. (YR)
Prerequisite(s): IMSE 317 and IMSE 3005*
Restriction(s): Can enroll if Level is Undergraduate
IMSE 4675  Six Sigma & Stat Proc Improv  4 Credit Hours
Review of graphical methods, probability theory and statistics (stem-and-leaf plots, histograms, scatter diagrams, counting methods, axioms of probability, common discrete and continuous probability models, expectation, linear combinations, estimation, sampling distributions, confidence intervals, hypothesis testing, and A vs. B type of experimentation for both unpaired and paired data); introduce quality terminology in manufacturing and service industry contexts, study the theory, design and application of common statistical process control models for variables and attributes; study process capability and gauge measurement capability methods; study the design and analysis, both graphical and analytic, of statistically designed experiments (one-way completely randomized designs, and randomized, complete block designs); study the application and analysis of two-level, factorial and fractional factorial designs. Learn to apply and interpret analysis of variance to above situations. Extensive analytic homework and applications used throughout course to motivate material. Each student completes an individual project of his/her own design, subject to instructor approval, entailing a modeling application or controlled experiment where the student collects the data. Four hours lecture. (YR)
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4745  Facilities Design  4 Credit Hours
Analysis, planning and design of physical facilities utilizing research, engineering and economic principles. Synthesis of physical equipment and workers into an integrated system for either service or manufacturing activities. Design of material handling and storage systems. Layout of lean manufacturing facilities. Design of atmospheric, electrical, lighting, and life safety systems for a facility. Students are required to select problems of interest and present design project reports. (F)
Prerequisite(s): IMSE 3005*
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4795  Prod, Inven Control & Lean Mfg  4 Credit Hours
Study of concepts involved in forecasting demand, inventory control, MRP, JIT production, lean manufacturing, aggregate scheduling, and project management. The application of mathematical programming techniques, bottleneck analysis, and lean techniques such as value stream mapping, error proofing, cellular manufacturing, etc. are used in design and analysis of production systems. Use of the computer programs in the design and analysis of such systems. Students are asked to select problems of interest and present final project reports. (OC)
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4815  Manufacturing Process II  4 Credit Hours
This course introduces the students to machining processes, metal forming processes and molding and forming of plastics. Metal cutting theory is emphasized including the mechanics of metal cutting, cutting tools, measurement of tool life, selection of cutting conditions, and chip control; theory and applications of non-traditional manufacturing processes. Metal forming theory is emphasized including formability of metals; analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Basic principles of plastic molding and forming processes of plastics, ceramics and composites. (W)
Prerequisite(s): IMSE 382 or ME 381
Corequisite(s): IMSE 4675
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 4825  Industrial Controls  4 Credit Hours
This course introduces the basics of calibration, error analysis, and dynamic response characteristics of instrumentation. Fundamentals of metrology include linear and angular measurements, standards, gauges, machine tool accuracy, and automation of inspection processes. The course also introduces the principle aspects of computers and their applications in system control, as well as principles of automation with emphasis on manufacturing industries. Discussion of the hardware and software associated with this task and other topics such as integrated systems modeling, sensor technologies, digital and analog signal processing and control, and information communication are also included. Laboratory exercises and projects are required. (F)
Prerequisite(s): ME 265
Corequisite(s): ECE 305
Restriction(s):
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

IMSE 4835  Comp.-Aided Prcs Design & Mfg  4 Credit Hours
This course focuses on the fundamentals of component and system designs through the use of Computer-Aided Design (CAD) tools. Issues related to the manufacture of molds, jigs and fixtures are also introduced and Computer-Aided Manufacturing (CAM) tools are used as means for the production of these machine components. The principles of design for manufacture and assembly as applied to tool and machine design are also discussed. Computer-Aided Process Planning (CAPP) tools, flexible manufacturing systems, and information flow in manufacturing systems are also presented. Hands-on experiments and course projects are required. (W)
Prerequisite(s): IMSE 382 or ME 381
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

IMSE 484  CA Machine and Tool Design  3 Credit Hours
Study of the fundamentals of machine tool design, cutting tools, metal forming dies, and jig fixtures for practical applications in machining and assembly. Principles of design for manufacture and assembly as applied to tool and machine design. Laboratory exercises and projects are required using computer-aided design software. Two lecture hours and three laboratory hours.
Prerequisite(s): IMSE 382 or ME 381
Restriction(s):
Can enroll if Level is Undergraduate
IMSE 486 Design for Assembly & Mfg 3 Credit Hours
This course will cover topics in manufacturing with emphasis on the parallel product design and selection of specifications for processes. Topics included are the principles of concurrent engineering, geometric dimensioning and tolerancing (GD&T), process engineering, process planning, cost estimating, and design for manufacturing. Projects using computer tools are required on a team-oriented basis.
Prerequisite(s): IMSE 382
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 488 Metal Forming Processes 3 Credit Hours
This course focuses on fundamentals of metal forming processes; mechanics of metal forming; formability of materials; tool and die design; design for manufacture; and economic aspects of the process. Emphasis is placed on analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Laboratory and course project are required.
Prerequisite(s): IMSE 382
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 489 Robotics Systems Simulation 3 Credit Hours
The course emphasizes the fundamentals of the design of robotics systems with the aid of robot simulation technology; structure and basic components of robots and robotics manufacturing workcells; control, kinematics, and dynamics of robots and manufacturing devices; robot accuracy and calibration of robot motion; applications of robots in manufacturing such as spot welding, arc welding, machining, assembly and CMM; robot simulation software such as ROBCAD or IGRIIP. Course project is required. Available for graduate credit. (YR)
Restriction(s):
Can enroll if Class is Senior or Graduate

IMSE 490 Selected Topics 3 Credit Hours
Individual or group study, design or laboratory research in a field of interest to the student. Topics may be chosen from any of the areas of industrial and systems engineering including management, work measurement, methods, organization, industrial sciences, industrial mathematics, systems and procedures. If preliminary arrangements are made, the work internship periods can be formulated to fit the problem and gather data. Completion of the analysis and submission of a report shall be done during the academic periods under the supervision of a faculty member or members. The student should be prepared for both a written and oral presentation of the report. This course is highly recommended as a technical elective. Permission of department.

IMSE 491 Directed Studies in IMSE 1 to 3 Credit Hours
Group study of contemporary topics in industrial and systems engineering and general systems design. Course may be elected for credit more than once under different instructors. Permission of department.

IMSE 4951 Design Project I 2 Credit Hours
Design of a system to produce or service using knowledge gained in previous courses in the program. Two two-hour lecture/lab periods. (F,W,S)
Prerequisite(s): ENGR 400* and (COMP 270* or COMP 106* or COMP 220*)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Industrial & Systems Engin

IMSE 4952 Design Project II 2 Credit Hours
Design of a system to produce or service using the knowledge gained in previous courses in the program. It is the continuation of the project started in Design Project I course. (F,W,S)
Prerequisite(s): IMSE 4951
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Industrial & Systems Engin

IMSE 4953 Design Project in Mfge 1 Credit Hour
Design of a manufacturing system to produce product using the knowledge gained in previous courses in the program. (F,W,S)
Prerequisite(s): ENGR 400*
Corequisite(s): ME 4671
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Mechanical Engineering

IMSE 498 Guided Study in IMSE 1 to 3 Credit Hours
Individual study, design, or laboratory research in a field of interest to the student. Content may be chosen from any of the areas on industrial and manufacturing engineering. The student will submit a report on his or her project at the close of the term. Permission of department. (F,W,S).
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

IMSE 499 Internship/Co-op 1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with classroom terms.
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Manufacturing Engineering
Manufacturing Engineering is concerned with designing, building, planning, operating, and managing economical production systems for discrete manufacturing. Manufacturing engineers need to have a thorough knowledge of materials and manufacturing processes. They should also be able to design, operate and manage integrated systems that include people, materials, machine tools, material handling equipment, robots, quality measuring equipment, controls and computers.

Traditionally, there has been a strong division between manufacturing engineering and design engineering. Today, however, the boundary between these two functions is narrowing. Both groups work together in teams to assure soundness of design and manufacturability of the product. Manufacturing engineers must understand engineering
materials and design besides having expertise in manufacturing tooling and processes, systems and technology. They design and evaluate the capabilities of manufacturing tools and processes, and interact with design engineers during the development of product specifications and tolerances.

Today’s manufacturing equipment is becoming increasingly computer-based. Manufacturing engineers must have a working knowledge of programmable equipment, as well as its interfaces with control hardware. They must understand the multi-layered control architecture of the integrated factory, and the computer-based technologies that enable it.

Undergraduate Degree Program
The Bachelor of Science in Manufacturing Engineering provides first a strong foundation in all of the basic ingredients of engineering: the natural and physical sciences, mathematics, socioeconomic-cultural background, the behavioral sciences and finally the basic engineering sciences that begin the development of problem-solving skills. Then, the program develops intermediate bases on which manufacturing engineering and systems are founded. This includes studies in engineering materials, manufacturing processes, probability and statistics, electronics, computers, human factors/ergonomics and operations research. The program then provides for the detailed study of several advanced topics related to process, assembly, and product engineering; manufacturing productivity and quality; and manufacturing integration methods and system design. Excellent laboratory facilities are available for students to conduct experiments and measure process variables.

Finally, students are required to complete a project dealing with the design of a production system to manufacture a product. The student has to address issues related to technological cost, aesthetics, feasibility, reliability, safety and ethics wherever applicable.

The Bachelor of Science Engineering in Manufacturing Engineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org (http://www.abet.org/)

An unusual opportunity is available to obtain considerable practical experience in manufacturing industries for those who elect the internship option.

Students who do well in their undergraduate program are encouraged to consider graduate work. Information and assistance regarding fellowships and assistantships for graduate studies may be obtained from the department chairperson.

Educational Objectives of the BSE (Manufacturing Engineering) Program
Consistent with providing a strong academic foundation in the field of Manufacturing Engineering, the program educational objectives for our graduates are:

- To remain gainfully employed in Manufacturing Engineering related fields,
- To continue develop professionally, and
- To serve in leadership roles.

Program Outcomes
To achieve the educational objectives, the graduates of the program will have:

a. an ability to apply knowledge of mathematics, sciences and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs
d. an ability to function on multidisciplinary teams
e. an ability to identify, formulate and solve engineering problems
f. an understanding of professional and ethical responsibility
g. an ability to communicate effectively
h. the broad education necessary to understand the impact of engineering solutions in a global and society context
i. a recognition of the need for, and an ability to, engage in lifelong learning and graduate studies
j. a knowledge of contemporary issues
k. an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Dearborn Discovery Core Requirement
The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)
Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements
A candidate for the degree Bachelor of Science in Engineering (Manufacturing Engineering) is required to pursue scholastic quality and
to complete satisfactorily the following program of study:

In addition to completion of the Dearborn Discovery Core, the following
courses are required to earn a BSE degree in Manufacturing Engineering
from UM-Dearborn.

### Code | Title | Credit Hours
--- | --- | ---
| | | |

#### Basic Requirements for Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 201</td>
<td>Prin: Macroeconomics (ECON 201 or 202 also fulfill 3 credits of DDC Social and Behavioral Analysis)</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 126</td>
<td>Engineering Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 134/144</td>
<td>General Chemistry IA</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 136/146</td>
<td>General Chemistry IIA</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td>3</td>
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</tbody>
</table>

#### Basic Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 255</td>
<td>Computer Programming for Eng</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 250</td>
<td>Principles of Eng Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 230</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 260</td>
<td>Design Stress Analyses</td>
<td>3</td>
</tr>
<tr>
<td>or ME 265</td>
<td>Applied Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 305</td>
<td>Intro to Electrical Eng</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Professional Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 382</td>
<td>Manufacturing Processes</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 421</td>
<td>Eng Economy and Dec Anlys</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 440</td>
<td>Applied stat models in engin</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4425</td>
<td>Human Factors and Ergonomics</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4675</td>
<td>Six Sigma &amp; Stat Proc Improv</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 4795</td>
<td>Prod, Inven Control &amp; Lean Mfg</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Technical Electives

Select 12-13 hours of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 3005</td>
<td>Intro to Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 381</td>
<td>Industrial Robots</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4545</td>
<td>Information Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4585</td>
<td>Simulation in Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4745</td>
<td>Facilities Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 4815</td>
<td>Manufacturing Process II</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 486</td>
<td>Design for Assembly &amp; Mfg</td>
<td>3</td>
</tr>
<tr>
<td>or ME 460</td>
<td>Design for Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 488</td>
<td>Metal Forming Processes</td>
<td>3</td>
</tr>
<tr>
<td>ME 484</td>
<td>Manufacturing Poly Comp Matl</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 350</td>
<td>Nanoscience and Nanotechnology</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 360</td>
<td>Des Inovtn: Proc, Meth &amp; Prct</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 399</td>
<td>Experiential Honors Prof. Prac</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 492</td>
<td>Exper Hnrs Dir Dsgn</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
<td>3</td>
</tr>
</tbody>
</table>

#### General Electives

Additional classes with the approval of advisors such that the total
credit hours in Professional Requirements in 53 credit hours.

### Dual Degree in Industrial and Systems Engineering

Please see the requirements for the BSE, Industrial and Systems
Engineering/Manufacturing Engineering in the Dual Degrees section of
this catalog.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 255</td>
<td>Computer Programming for Eng</td>
<td>3</td>
</tr>
</tbody>
</table>

Intermediate topics in computer programming: arrays, files, structured
data types, pointers, functions. Overview of digital computer hardware
and system software components: machine architecture, operating
systems, computer networks, data security, and performance evaluation.

**Prerequisite(s):** ENGR 100 or MATH 105 or Mathematics Placement with
a score of 113

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 299</td>
<td>Internship/Co-Op</td>
<td>1</td>
</tr>
</tbody>
</table>

This is a Cooperative Education course. Students wishing to experience
a work experience before graduation may elect to participate in the
Cooperative Education Program (minimum of two terms). (F,W,S).

**Restriction(s):**
Can enroll if Class is Junior or Senior or Graduate
IMSE 3005  Intro to Operations Research  4 Credit Hours
This course introduces some basic techniques or operations research used in decision making and system performance evaluation in both deterministic and probabilistic environments. Topics in linear programming, especially the simplex method with duality theory and sensitivity analysis is included. Other topics include integer programming, deterministic dynamic programming, network problems, PERT-CPM, discrete-time and continuous-time Markov chain models of random processes, queuing theory and applications. (YR)
Prerequisite(s): (MATH 217 or MATH 227) and IMSE 317*

IMSE 317  Eng Probability and Statistics  3 Credit Hours
Set theory, combinatorial analysis, probability and axioms, random variables, continuous and discrete distribution functions, expectations, Chebychev's inequity, weak law of large numbers, central limit theorem, sampling statistics and distributions, point and interval estimation and linear regression. Three hours lecture.
Prerequisite(s): MATH 116 or Mathematics Placement with a score of 215 or MATH 114

IMSE 334  Org of Hospital Systems  3 Credit Hours
The fundamental concepts of organizational behavior are explored. The interrelationships among personnel in an organization, and the functions and responsibilities of individuals are discussed. Topics studied include decision-making theory, organizational authority and adjacent responsibility, leadership and supervision. Particular emphasis is placed upon hospitals and the health care industry. Lectures are supplemented with actual case studies from the health care industry in which the student has the opportunity to apply problem-solving techniques to true-to-life situations. Three hours lecture.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

IMSE 350  Data Structures  4 Credit Hours
This course focuses on data design and algorithm designs. Data design topics include object-oriented discussions of hashing, advanced tree structures, graphs and sets. Algorithm design topics include the greedy, divide-and-conquer, dynamic programming, backtracking, and branch-and-bound techniques. A significant discussion of algorithm complexity theory, including time and space trade-off and elementary computability theory is included.
Prerequisite(s): MATH 115 and (CIS 200 or IMSE 200) and CIS 275

IMSE 351  Data Struc & Algorithm Anlysis  3 Credit Hours
Object-oriented design, programming, and analysis techniques review; structured programming concepts; data structures; algorithm design and analysis; lists, stacks, and queues; heaps, sorting, trees, graphs, and algorithm development utilizing modern languages, such as C++, Java.
Prerequisite(s): IMSE 255 or CIS 150 or IMSE 150 or CCM 150

IMSE 352  Intro to File Processing  3 Credit Hours
File processing environment, storage media, sequential, random and indexed sequential files, inverted lists, multilists, tree structures, file control systems. Three hours lecture.
Prerequisite(s): IMSE 200 and CIS 175

IMSE 356  Real Time Computing  3 Credit Hours
Introduction to real time computing concepts applicable to discrete systems. Fundamentals of real time hardware, operating systems and C programming language. Selected coverage of instrumentation, input/ output modes, data conversion, single task and multitask programming. Two hours of lecture and three hours of laboratory per week.
Prerequisite(s): IMSE 150 or IMSE 255

IMSE 381  Industrial Robots  4 Credit Hours
The course introduces students in engineering and computer science to fundamentals of robotics technology, programming and their applications in industrial environment. The emphasis will be on robotics anatomy and configurations, robotics kinematics, end effectors, use of sensors in robotics, robotics programming, design of robot workcell, robotics applications to production problems, cost justifications and robotics safety, rather than on the extensive theory of robotics. Three-hour lecture and three-hour laboratory per week.
Prerequisite(s): MATH 115
Restriction(s):
Can enroll if Class is Junior or Senior

IMSE 382  Manufacturing Processes  4 Credit Hours
This course introduces the students to the fundamentals and principles of manufacturing processes for engineering materials. It seeks to transfer an understanding of the application of principles of engineering materials and their influence on manufacturing processes. Topics covered include structure and manufacturing properties of metals, casting, heat treatments, bulk deformation processes, sheet metal working processes, processing of polymers and composites, surfaces and coating, powder metallurgy, machining and joining. Case studies of design for manufacturing and measurement of product quality, economical aspects and cost considerations in manufacturing systems will be studied. Three lecture hours and three laboratory hours.
Prerequisite(s): ENGR 250 and (ME 265 or ME 260)
Corequisite(s): IMSE 382L

IMSE 390  Selected Topics I  3 Credit Hours
Study of topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.

IMSE 391  Selected Topics II  3 Credit Hours
Study of Advanced topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.

IMSE 398  Independent Study in IMSE  3 Credit Hours
Study of topics selected from any of the areas of Industrial and Systems Engineering. May include design or laboratory research.

IMSE 399  Internship/ Co-Op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

IMSE 400  Programming Languages  4 Credit Hours
Systematic study of programming languages with regard to their implementation, structures, and use. Languages are compared with regard to their various data types, data structures, operations, control structures, programming environments, and ease of use in solving various programming problems.
Prerequisite(s): IMSE 350 or CIS 350 or CCM 350
Restriction(s):
Can enroll if Level is Undergraduate
IMSE 421  Eng Economy and Dec Anlys  3 Credit Hours
Study of the concepts involved in the analysis of engineering management decisions, both short and long term. Time valued investments and the effects of depreciation and taxes in comparing alternatives are discussed. Specific attention is devoted to deterministic and probabilistic replacement policies for single and chain replacements of equipment. Basic elements of utility theory are introduced. Applications of decisions under risk, uncertainty, and of game theory to capital investment, bidding, and to competitive decisions are included.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

IMSE 437  Health Care Management  3 Credit Hours
This course is intended for those who have to deal with the administrative aspects of health care systems and not only the technical. The goal of the course is to provide the hospital staff member with an understanding of operations of the total hospital system. Topics covered include functions, problems, and organization of the medical agencies and their effect upon hospitals; methods of nursing staff organization; techniques of determining nursing staff levels; development of staff schedules; financial reimbursement and governmental regulations.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

IMSE 440  Applied stat models in engin  3 Credit Hours
Full Course Title: Applied statistical models in engineering The course provides students with considerable experience to flexibly work with Linear Regression Models and Design of Experiments. With the growth of automated systems, data analysis became an essential tool in engineering. The first part of the course introduces students to Simple Linear Models, Multiple Linear Models, Model Evaluation, Model Diagnosis, Analysis of Variance, Residual Analysis, and Model Selection. The second part of the course introduces students to Design of Experiments and commonly used designs such as the Completely Randomized Design, Randomized Complete Block Design, and Latin Squares Design. The course also provides the students with experience handling data for engineering applications via in-class activities and assignments. Student teams complete a major data analysis project to answer a set of engineering questions and challenges. (YR)
Prerequisite(s): IMSE 317 or BENG 364 or ME 364
Restriction(s):
Can enroll if College is Engineering and Computer Science

IMSE 4425  Human Factors and Ergonomics  4 Credit Hours
The course integrates the elements of traditional methods of engineering and time-motion studies with ergonomics and human factors concepts. Methods improvement, work measurement, and work design, applied to manufacturing and service industries, so as to increase productivity and improve worker health and safety. The topics covered include: problem solving tools; operation analysis; time-motion analysis; work sampling; manual and cognitive work design; workplace, equipment, tool and work environment design; allowances; and lean manufacturing. Lectures and laboratory. (YR)
Prerequisite(s): IMSE 317 or BENG 364
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 450  Operating Systems  4 Credit Hours
Introduction to computer operating systems. Process management, CPU scheduling, memory management, file systems and I/O devices. Advanced topics, e.g., multiprogramming and multitasking, virtual memory, deadlock, I/O, job scheduling, and performance analysis using queueing models, will be introduced. Case studies of modern operating systems. A design project is required.
Prerequisite(s): (CIS 350 or CIS 3501 or IMSE 350) or (ECE 370 and MATH 276) or (ECE 276 and ECE 370) and IMSE 317

IMSE 451  Computer Graphics  3 Credit Hours
The mathematics, algorithms and data structures of computer graphics programming in 2 or 3 dimensions. Applications of computer graphics in Engineering Science and Data Processing.
Prerequisite(s): IMSE 351 or CIS 351 or CIS 350 or IMSE 350 or CCM 350

IMSE 453  Data Comm/Distributed Process  4 Credit Hours
Study of the technical and management aspects of controlling networks and distributed systems. Topics include network architectures (ISO/ OSI, TCP/IP, ATM), communication hardware (transmission media, network adapters, switches), encoding, framing, error detection and correction, reliable transmission, data link control and LAN technology, internetworking, routing/congestion control, network design/ management.
Prerequisite(s): CIS 350 or CIS 351 or IMSE 351 or (ECE 370 and MATH 276) or (ECE 370 and ECE 276) and IMSE 317

IMSE 4545  Information Systems Design  4 Credit Hours
Role of information systems in organizations. Economic factors and social impact of information systems. Phases to design an information system: systems objectives and criteria establishment, fact investigation and analysis, feasibility study, output-input design, processing design, file and database design, safety and reliability considerations, detailed systems description, programming specifications, testing analysis and design skills will be assigned. A series of cases will be used in developing an information system. SQL will be used to develop data tables and access information. Three lecture hours and one three-hour laboratory. (W)
Prerequisite(s): IMSE 255 or CIS 205
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 456  Intro to Data Base Systems  4 Credit Hours
An introduction to database system concepts and techniques. Topics covered include database environments, ER modeling, relational data model, object-oriented database, object-relational database, database design theory and methodologies, database languages, query processing and optimization, concurrency control, database recovery, and database security.
Prerequisite(s): CIS 350 or CIS 350A or IMSE 351 or (ECE 370 and MATH 276)

IMSE 457  Compiler Design  3 Credit Hours
The design and construction of compilers and programming systems. Lexical scan; parsing techniques; code generation and optimization. Runtime organization; storage allocation. Applications of formal language theory in compiler design. Translator writing systems; XPL. Three one-hour lectures.
Prerequisite(s): IMSE 350 or CIS 350 or CCM 350
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IMSE 4585</td>
<td>Simulation in Systems Design</td>
<td>4</td>
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<td></td>
<td>This course introduces digital simulation as a design and modeling tool. The fundamental techniques of constructing a simulation model and evaluating the results are studied. A computer simulation software is used (such as ARENA, ProModel, Witness, Simul8). Topics include random number and random variate generation, input and output data analysis, design of experiments and optimization of simulated systems, verification and validation, discrete and continuous simulation models, comparison of simulation modeling software, and applications of simulation in different industries. Students are asked to select problems of interest and present final project reports. Four lecture hours. (YR)</td>
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<tr>
<td>IMSE 4675</td>
<td>Six Sigma &amp; Stat Proc Improv</td>
<td>4</td>
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<td></td>
<td>Review of graphical methods, probability theory and statistics (stem-and-leaf plots, histograms, scatter diagrams, counting methods, axioms of probability, common discrete and continuous probability models, expectation, linear combinations, estimation, sampling distributions, confidence intervals, hypothesis testing, and A vs. B type of experimentation for both unpaired and paired data); introduce quality terminology in manufacturing and service industry contexts, study the theory, design and application of common statistical process control models for variables and attributes; study process capability and gauge and measurement capability methods; study the design and analysis, both graphical and analytic, of statistically designed experiments (one-way completely randomized designs, and randomized, complete block designs); study the application and analysis of two-level, factorial and fractional factorial designs. Learn to apply and interpret analysis of variance to above situations. Extensive analytic homework and applications used throughout course to motivate material. Each student completes an individual project of his/her own design, subject to instructor approval, entailing a modeling application or controlled experiment where the student collects the data. Four hours lecture. (YR)</td>
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<tr>
<td>IMSE 4745</td>
<td>Facilities Design</td>
<td>4</td>
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<tr>
<td></td>
<td>Analysis, planning and design of physical facilities utilizing research, engineering and economic principles. Synthesis of physical equipment and workers into an integrated system for either service or manufacturing activities. Design of material handling and storage systems. Layout of lean manufacturing facilities. Design of atmospheric, electrical, lighting, and life safety systems for a facility. Students are required to select problems of interest and present design project reports. (F)</td>
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<tr>
<td>IMSE 4795</td>
<td>Prod, Inven Control &amp; Lean Mfg</td>
<td>4</td>
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<tr>
<td></td>
<td>Study of concepts involved in forecasting demand, inventory control, MRP, JIT production, lean manufacturing, aggregate scheduling, and project management. The application of mathematical programming techniques, bottleneck analysis, and lean techniques such as value stream mapping, error proofing, cellular manufacturing, etc. are used in design and analysis of production systems. Use of the computer programs in the design and analysis of such systems. Students are asked to select problems of interest and present final project reports. (OC)</td>
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<tr>
<td>IMSE 4815</td>
<td>Manufacturing Process II</td>
<td>4</td>
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<td>This course introduces the students to machining processes, metal forming processes and molding and forming of plastics. Metal cutting theory is emphasized including the mechanics of metal cutting, cutting tools, measurement of tool life, selection of cutting conditions, and chip control; theory and applications of non-traditional manufacturing processes. Metal forming theory is emphasized including formability of metals; analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Basic principles of plastic molding and forming processes of plastics, ceramics and composites. (W)</td>
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<tr>
<td>IMSE 4825</td>
<td>Industrial Controls</td>
<td>4</td>
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<td>This course introduces the basics of calibration, error analysis, and dynamic response characteristics of instrumentation. Fundamentals of metrology include linear and angular measurements, standards, gauges, machine tool accuracy, and automation of inspection processes. The course also introduces the principle aspects of computers and their applications in system control, as well as principles of automation with emphasis on manufacturing industries. Discussion of the hardware and software associated with this task and other topics such as integrated systems modeling, sensor technologies, digital and analog signal processing and control, and information communication are also included. Laboratory exercises and projects are required. (F)</td>
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<tr>
<td>IMSE 4835</td>
<td>Comp.-Aided Pracs Design &amp; Mfg</td>
<td>4</td>
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<td>This course focuses on the fundamentals of component and system designs through the use of Computer-Aided Design (CAD) tools. Issues related to the manufacture of molds, jigs and fixtures are also introduced and Computer-Aided Manufacturing (CAM) tools are used as means for the production of these machine components. The principles of design for manufacture and assembly as applied to tool and machine design are also discussed. Computer-Aided Process Planning (CAPP) tools, flexible manufacturing systems, and information flow in manufacturing systems are also presented. Hands-on experiments and course projects are required. (W)</td>
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<tr>
<td>ECE 305</td>
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<tr>
<td>IMSE 482</td>
<td>CA Machine and Tool Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Study of the fundamentals of machine tool design, cutting tools, metal forming dies, and jigs for practical applications in machining and assembly. Principles of design for manufacture and assembly as applied to tool and machine design. Laboratory exercises and projects are required using computer-aided design software. Two lecture hours and three laboratory hours.</td>
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</tbody>
</table>
IMSE 486  Design for Assembly & Mfg  3 Credit Hours
This course will cover topics in manufacturing with emphasis on the parallel product design and selection of specifications for processes. Topics included are the principles of concurrent engineering, geometric dimensioning and tolerancing (GD&T), process engineering, process planning, cost estimating, and design for manufacturing. Projects using computer tools are required on a team-oriented basis.
Prerequisite(s): IMSE 382
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 488  Metal Forming Processes  3 Credit Hours
This course focuses on fundamentals of metal forming processes; mechanics of metal forming; formability of materials; tool and die design; design for manufacture; and economic aspect of the process. Emphasis is placed on analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Laboratory and course project are required.
Prerequisite(s): IMSE 382
Restriction(s):
Can enroll if Level is Undergraduate

IMSE 489  Robotics Systems Simulation  3 Credit Hours
The course emphasizes the fundamentals of the design of robotics systems with the aid of robot simulation technology; structure and basic components of robots and robotics manufacturing workcells; control, kinematics, and dynamics of robots and manufacturing devices; robot accuracy and calibration of robot motion; applications of robots in manufacturing such as spot welding, arc welding, machining, assembly and CMM; robot simulation software such as ROBCAD or IGRIP. Course project is required. Available for graduate credit. (YR)
Restriction(s):
Can enroll if Class is Senior or Graduate

IMSE 490  Selected Topics  3 Credit Hours
Individual or group study, design or laboratory research in a field of interest to the student. Topics may be chosen from any of the areas of industrial and systems engineering including management, work measurement, methods, organization, industrial sciences, industrial mathematics, systems and procedures. If preliminary arrangements are made, the work internship periods can be formulated to solve the problem and gather data. Completion of the analysis and submission of a report shall be done during the academic periods under the supervision of a faculty member or members. The student should be prepared for both a written and oral presentation of the report. This course is highly recommended as a technical elective. Permission of department.

IMSE 491  Directed Studies in IMSE  1 to 3 Credit Hours
Group study of contemporary topics in industrial and systems engineering and general systems design. Course may be elected for credit more than once under different instructors. Permission of department.

IMSE 4951 Design Project I  2 Credit Hours
Design of a system to produce or service using the knowledge gained in previous courses in the program. Two two-hour lecture/laboratory periods. (F,W,S)
Prerequisite(s): ENGR 400* and (COMP 270* or COMP 106* or COMP 220*)
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Industrial & Systems Engin

IMSE 4952 Design Project II  2 Credit Hours
Design of a system to produce or service using the knowledge gained in previous courses in the program. It is the continuation of the project started in Design Project I course. (F,W,S)
Prerequisite(s): IMSE 4951
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Industrial & Systems Engin

IMSE 4953 Design Project in Mfge  1 Credit Hour
Design of a manufacturing system to produce product using the knowledge gained in previous courses in the program. (F,W,S)
Prerequisite(s): ENGR 400*
Corequisite(s): ME 4671
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Manufacturing Engineering, Mechanical Engineering

IMSE 498  Guided Study in IMSE  1 to 3 Credit Hours
Individual study, design, or laboratory research in a field of interest to the student. Content may be chosen from any of the areas on industrial and manufacturing engineering. The student will submit a report on his or her project at the close of the term. Permission of department. (F,W,S).
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

IMSE 499  Internship/Co-op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with classroom terms.
Restriction(s):
Can enroll if Class is Senior
Can enroll if Level is Undergraduate

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F,W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Mechanical Engineering

The mechanical engineering field is one of the oldest of the several engineering fields. It is also one of the broadest in scope, for it is not identified with nor restricted to any particular technology (like nuclear engineering), nor to any particular vehicle (like land-based automobiles), nor to any particular device or particular system. It is, in fact, concerned with so many areas of modern technology that the tasks and challenges of the mechanical engineer are most interesting and varied.

The field is logically associated with mechanical things, but this can lead to a restrictive image. For example, one often associates mechanical engineers with automobiles and, thus, with engines. To the non-engineer this is an acceptable association that implies a knowledge of pistons and carburetors. As engineers know, this picture is very shallow; the breadth of understanding implied when one thinks of designing an
engine challenges the imagination. Automobile engines are just one of many devices that convert energy into useful work. To understand this conversion process is also to understand the basic principles of energy conversion applicable to solar engines, jet engines, gas turbines, fuel cells, ship-propulsion systems, rocket engines, hydro-electric power plants, and new kinds of converters not yet developed. The mechanical engineer possesses this universally applicable background in thermodynamics, heat transfer, fluid mechanics, aerodynamics, and combustion theory that is basic to all such systems. The mechanical engineer also has a similar understanding of materials from steels to textiles to biological materials to the latest plastics and the most exotic high temperature composites. The point is that everything that is built is achieved by applying these same principles and using these same materials.

To understand the dynamic nature of most mechanical devices and systems requires a thorough mastery of forces and stresses, of vibrations and acoustics, of shock and impact, of deformation and fracture. Yet, these are basic to virtually every product devised by people or found in nature. Automobiles are just one small example of where they are important.

Thus, the mechanical engineer is a designer who creates physical things of all sorts because the mechanical engineer’s breadth of background is everywhere applicable. The mechanical engineer produces machines to build other machines, and thus is in the forefront of new manufacturing technology. In this role the engineer is faced with the task of building new things created by all kinds of engineers. This exposes the engineer to other technologies, and the mechanical engineer must be able to grasp their essence easily. For example, as the builder of energy devices to tap the oceans’ resources, the mechanical engineer is simultaneously one of the oceanographers, one of the chemists, and one of the environmentalists, as well as the master designer.

The mechanical engineer is comfortable working with people as well as with machines. For example, the role in vehicle design is that of making technical advances in performance, efficiency, and cost while simultaneously meeting the life and comfort requirements of operators and passengers. Logically, then, the mechanical engineer is active in the new fields of biomechanics, biomaterials, biomedical fluid mechanics and heat transfer, air and water pollution, water desalinization, sensory aids, and prostheses.

**Undergraduate Degree Program**

The Bachelor of Science Engineering in Mechanical Engineering provides a strong foundation in all of the basic ingredients of engineering: the natural and physical sciences, mathematics, a comprehensive socio-economic-cultural background, the behavioral sciences, and finally the basic engineering sciences that begin the development of problem-solving skills.

The program provides for the detailed study of several advanced topics, including fluid machinery, heat transfer, manufacturing processes, vibration theory, stress analysis, metallurgy, electrical science, and control systems.

The greatest strength of the undergraduate program is the project-oriented design work that requires the student to organize thinking of the multitude of factors on which every design is based - performance, efficiency, esthetics, cost, reliability, safety, reparability, etc. - and to reach sound conclusions that the student must be prepared to defend and implement. This is the art of engineering, and its study permeates the courses and laboratories of the upper-level instruction in this field.

For those who choose the cooperative education option, it is possible to develop a more thorough understanding of how design factors are considered and how decisions are implemented in industrial organizations.

The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org (http://www.abet.org/)

**Program Educational Objectives**

The Program Educational Objectives for the Bachelor of Science in Engineering in Mechanical Engineering are that our graduates will:

1. Be successfully employed in their discipline or a closely related field and contribute to the economy of the state and the nation.
2. Continue to enhance their knowledge base and skills through graduate degrees or other professional development, to keep abreast of ongoing changes in technology and related disciplines.
3. Be well rounded and well suited to work with colleagues and professionals with diverse backgrounds and cultures, and a wide range of competencies.

To achieve the educational objectives, the graduates of the program will have:

a. an ability to apply knowledge of mathematics, sciences and engineering.

b. an ability to design and conduct experiments, as well as to analyze and interpret data.

c. an ability to specify, model, and design a system, component or process to meet desired needs.

d. an ability to function on multidisciplinary teams.

e. an ability to identify, formulate and solve engineering problems.

f. an understanding of professional and ethical responsibility.

g. an ability to communicate effectively.

h. the broad education necessary to understand the impact of engineering solutions in a global and societal context, including environmental and economical impacts.

i. a recognition of the need for, and an ability to, engage in life-long learning.

j. a knowledge of contemporary issues.

k. an ability to use the techniques, skills and modern engineering tools, such as information technology, which are necessary for engineering practice.

**Dearborn Discovery Core Requirement**

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.
Foundational Studies
Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry
Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
  • Lecture/Lab Science Course
  • Additional Science Course

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements
A candidate for the degree Bachelor of Science in Engineering (Mechanical Engineering) is required to pursue scholastic quality and to complete satisfactorily the following program of study.

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a BSE degree in Mechanical Engineering from UM-Dearborn.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134/144</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 136/146</td>
<td>General Chemistry IIA</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 151</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 216</td>
<td>Computer Meth for Engineers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 250</td>
<td>Principles of Eng Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 230</td>
<td>Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>ME 260</td>
<td>Design Stress Analyses</td>
<td>4</td>
</tr>
</tbody>
</table>

Professional Subjects and Program Electives

ECE 305 Intro to Electrical Eng 4
ME 442 Control Syst Anly and Design 4
ME 325 Thermal Fluid Sciences I 4
ME 345 Engineering Dynamics 4
ME 349 Instrument & Measuremt Systems 3
ME 3601 Des and Analy of Mach Elem 4
ME 364 Prob, Stats, and Rel in Mach D 3
ME 375 Thermal Fluid Sciences II 4
ME 379 Thermal-Fluids Laboratory 3
ME 381 Manufacturing Processes I 4

Senior Design Project
ME 4671 Senior Design I 4
ME Design Electives 3-4

Choose one course from the following

ME 4191 Structural Mech & Design
ME 4201 Design of Turbomachinery
or ME 4202 Design Turbo. and Wind Gen.
ME 4361 Design of HVAC Systems
ME 4471 Solar Energy Sys Analy&Design
ME 460 Design for Manufacturing
ME 472 Prin & Appl of Mechatronic Sys
ME 483 Dsgn Cons in Poly and Comp Mat
ME 490 Directed Design Project
ME 493 Advanced Vehicle Energy Sys
BENG 370 Biomechanics I
BENG 451 Microfluidics
ENGR 493 Exper Hnrs Dir Dsgn

Upper-Level Tech Electives

Select 9-10 additional credits from above or from the following

ME 410 Finite Element Method wth Appl
ME 4301 Computational Thermo-Fluids
ME 4461 Mech Vibration & Noise Control
ME 452 Sustainable Energy & Environ
or ME 4521 Intro Sust Energy Systems
ME 481 Manufacturing Processes II
ME 484 Manufacturing Poly Comp Matl
ME 491 Directed Research Problems
ME 492 Guided Study in Mech Eng
ME 496 Internal Combustion Engines I
ME 260 Corequisite(s): ME 260. Recitation component of ME 260. Must be taken concurrently with ME 260R. Design Stress Analysis 4 Credit Hours
A comprehensive introduction to the science of applied mechanics, encompassing a study of forces and the stresses, deflections, and motions which they produce. Topics include the concept of equilibrium and static force analysis; the mechanics of deformable bodies (internal stresses, constitutive relationships, strains, deflections, failure); statics of indeterminate systems; kinematics; kinetics of particles, systems of particles, and rigid bodies. Four hours lecture. This course is not open to ME majors (F, S, W).
Prerequisite(s): PHYS 150 and (MATH 205* or Mathematics Placement with a score of 215 or MATH 215*)
Restriction(s):
Cannot enroll if Major is Mechanical Engineering.

ME 265 Applied Mechanics 4 Credit Hours
A comprehensive introduction to the science of applied mechanics, encompassing a study of forces and the stresses, deflections, and motions which they produce. Topics include the concept of equilibrium and static force analysis; the mechanics of deformable bodies (internal stresses, constitutive relationships, strains, deflections, failure); statics of indeterminate systems; kinematics; kinetics of particles, systems of particles, and rigid bodies. Four hours lecture. This course is not open to ME majors (F, S, W).
Prerequisite(s): PHYS 150 and (MATH 205* or Mathematics Placement with a score of 215 or MATH 215*)
Restriction(s):
Cannot enroll if Major is Mechanical Engineering.

ME 299 Internship/ Co-op 1 Credit Hour
This is a Cooperative Education course. Students wishing to experience a work experience before graduation may elect to participate in the Cooperative Education Program (minimum of two terms). (F,W,S).
Restriction(s):
Cannot enroll if Class is Junior or Senior or Graduate

ME 325 Thermal Fluid Sciences I 4 Credit Hours
Prerequisite(s): ENGR 216 and ME 230 and ME 260
Restriction(s):
Cannot enroll if Class is Sophomore or Junior or Senior

ME 345 Engineering Dynamics 4 Credit Hours
A comprehensive treatment of statics and the kinematics and kinetics of particles, systems of particles, and rigid bodies from a Newtonian viewpoint utilizing rigorous vector techniques. The time-dependent description of kinematical quantities and of dynamic forces and moments. Matrix methods and digital computer techniques.
Prerequisite(s): (ENGR 216 or ME 215) and ME 260 and MATH 216

ME 349L Thermodynamics 0 Credit Hours
Recitation component for ME 349. Must be taken concurrently with ME 349.

ME 360R Design Stress Analysis 0 Credit Hours
Recitation component of ME 360. Must be taken concurrently with ME 360.

ME 399 Experiential Honors Prof. Prac 3 Credit Hours
Special topics in mechanical engineering selected according to students’ interest and availability of instructors and equipment.

ME 421 Exper Honors Directed Research 3 Credit Hours
Cannot enroll if Major is Mechanical Engineering.

ME 4981 Automotive Engineering 3 Credit Hours

ME 592 Bioprocessing 3 Credit Hours

ME 594 Advanced Biomechanics 4 Credit Hours

ME 635 Applied Mechanics 4 Credit Hours

ME 641 Advanced Biomechanics 3 Credit Hours

ME 645 Advanced Engineering Dynamics 3 Credit Hours

ME 649 Advanced Thermodynamics 3 Credit Hours

ME 699 Advanced Mechanical Engineering Research 3 Credit Hours

ME 699E Engineering Research 1 Credit Hour

ME 699M Mechanical Engineering Research 1 Credit Hour

ME 699M Mechanical Engineering Research 1 Credit Hour

ME 791 Bioprocessing 1 Credit Hour

ME 850 Nanoscience and Nanotechnology 3 Credit Hours

ME 999 Directed Research 3 Credit Hours

ENG Electives
Select 3-4 credits of general elective coursework. Fewer than 4 credits are needed if additional CECS credits were taken above.

ME 230 Thermodynamics 4 Credit Hours
The course is a general introduction to thermodynamics with emphasis on engineering applications. Properties of pure substances. Work and heat. The first and second laws of thermodynamics. Entropy and efficiency. Applications to systems and control volumes. Mixtures of gases and vapors, air conditioning. Introduction to cycles. This course will become the first in a two-course series for mechanical engineering students, and will also be elected as a terminal course by IMSE students.
Four hours lecture.
Prerequisite(s): PHYS 150 and (MATH 116 or Mathematics Placement with a score of 215) and (CHEM 134 or CHEM 144)
Corequisite(s): ME 230R
Restriction(s):
Can enroll if Major is Electrical Engineering, Manufacturing Engineering, Industrial & Systems Engin, Mechanical Engineering, Bioengineering, Engineering

ME 230R Thermodynamics 0 Credit Hours
Recitation component for ME 230. Must be taken concurrently with ME 230.
Corequisite(s): ME 230

ME 260 Design Stress Analysis 4 Credit Hours
An introduction to statics and stress analyses with emphasis on both mechanics fundamentals and design applications. (F,W,S).
Prerequisite(s): PHYS 150 and (ENGR 250* or ECE 385*) and (MATH 205* or Mathematics Placement with a score of 215 or MATH 215*)
Corequisite(s): ME 260R
Restriction(s):
Can enroll if College is Engineering and Computer Science

ME 260R Design Stress Analysis 0 Credit Hours
Recitation component of ME 260. Must be taken concurrently with ME 260.
Corequisite(s): ME 260

ME 265 Applied Mechanics 4 Credit Hours
A comprehensive introduction to the science of applied mechanics, encompassing a study of forces and the stresses, deflections, and motions which they produce. Topics include the concept of equilibrium and static force analysis; the mechanics of deformable bodies (internal stresses, constitutive relationships, strains, deflections, failure); statics of indeterminate systems; kinematics; kinetics of particles, systems of particles, and rigid bodies. Four hours lecture. This course is not open to ME majors (F, S, W).
Prerequisite(s): PHYS 150 and (MATH 205* or Mathematics Placement with a score of 215 or MATH 215*)
Restriction(s):
Cannot enroll if Major is Mechanical Engineering.

ME 299 Spec Topics in Mech Engin 1 to 3 Credit Hours
Special topics in mechanical engineering selected according to students’ interest and availability of instructors and equipment.

ME 325 Thermal Fluid Sciences I 4 Credit Hours
Prerequisite(s): ENGR 216 and ME 230 and ME 260
Restriction(s):
Cannot enroll if Class is Sophomore or Junior or Senior

ME 345 Engineering Dynamics 4 Credit Hours
A comprehensive treatment of statics and the kinematics and kinetics of particles, systems of particles, and rigid bodies from a Newtonian viewpoint utilizing rigorous vector techniques. The time-dependent description of kinematical quantities and of dynamic forces and moments. Matrix methods and digital computer techniques.
Prerequisite(s): (ENGR 216 or ME 215) and ME 260 and MATH 216

ME 349 Instrument & Measuremt Systems 3 Credit Hours
Modern instrumentation systems are considered beginning with generic issues such as calibration, error analysis, and dynamic response characteristics of instrumentation. Specific transducer systems (temperature, force and pressure, etc.) are presented, as well as interfacing techniques and elementary signal processing. Microprocessors are introduced for use in measurement and control applications. (F,W,S).
Prerequisite(s): (ME 265 or ME 345) and ECE 305
Corequisite(s): ME 349L
Restriction(s):
Cannot enroll if Class is Sophomore or Junior or Senior

Can enroll if Level is Undergraduate

Can enroll if College is Engineering and Computer Science
ME 361 Des and Analy of Mach Elem 4 Credit Hours
Application of fundamental mechanics to analysis and design of elementary mechanical components and systems. Topics include: stress
and strain analysis; experimental measurement; stress concentration;
failure theories; safety factor; fatigue; fracture; combined loading;
impact; buckling; energy methods. Components considered: fasteners;
springs; bearings; gears; beams; shafts and other power transmission
Prerequisite(s): (ENGR 216 or ME 215) and ME 260
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if Major is , Mechanical Engineering, Bioengineering

ME 364 Prob, Stats, and Rel in Mach D 3 Credit Hours
Introduction to planned experiments in machine design and mechanical
metallurgy with emphasis on orthogonal test programs with small
blocks. Classical statistical analyses (e.g., analysis of variance for
randomized complete block and split-plot designs) as well as computer
intensive analyses (e.g., permutation and randomization tests). Maximum
likelihood analysis for censored and uncensored life data and for strength
(quantal response) data. Systems reliability in machine design.
Prerequisite(s): (MATH 217 or MATH 227) and ME 260 and ENGR 216

ME 371 Heat Transfer 3 Credit Hours
Mechanisms of heat transfer processes. Steady and transient conduction
in solids; analytical, numerical, and analogical methods. Thermal
radiation processes; steady radiation exchange with black and gray
surfaces and enclosures. Hydrodynamic boundary layer theory in
convection heat transfer, thermal boundary layer, exact and integral
analyses. Aerodynamic heating. Turbulent boundary layers. Reynolds'
and Prandtl's analogies. Free convection. Working formulas for forced
and free convection, condensation, and boiling. Combined heat transfer
mechanisms; heat exchangers. Three hours lecture.
Prerequisite(s): ME 320 and ECE 305*

ME 375 Thermal Fluid Sciences II 4 Credit Hours
Mechanisms of heat transfer processes. Steady state and transient
conduction. Numerical methods in conduction. Internal and external
flows. Boundary layer theory. Compressible flows. Convection
heat transfer in internal and external flows. Heat exchanger theory.
Introduction to radiation. (F,W,S).
Prerequisite(s): (ME 325 or ME 320) and ECE 305*
Restriction(s):
Can enroll if Class is Sophomore or Junior or Senior
Can enroll if College is Engineering and Computer Science

ME 379 Thermal-Fluids Laboratory 3 Credit Hours
An experimental investigation of thermodynamic, fluid mechanic,
and heat transfer principles. Students will learn about thermal-fluids
instrumentation and conduct experiments. In addition, they will design
their own experiments to demonstrate their understanding of the
principles. (F,W,S).
Prerequisite(s): (ME 320 or ME 325 or ME 3251 or ME 3252) and (ME 349
or BENG 351) and (ME 371* or ME 375*) and (COMP 270 or COMP 106 or
Composition Placement Score with a score of 40 or COMP 220)

ME 381 Manufacturing Processes I 4 Credit Hours
This course introduces the students to the fundamentals and principles of manufacturing processes for engineering materials. It seeks to
transfer an understanding of the application of principles of engineering
materials and their influence on manufacturing processes. Topics
covered include structure and manufacturing properties of metals,
casting, heat treatments, bulk deformation processes, sheet metal
working processes, processing of polymers and composites, surfaces
and coating, powder metallurgy, machining and joining. Case studies
design of manufacturing and measurement of product quality;
economical aspects and cost considerations in manufacturing systems
will be studied. Three lecture hours and three laboratory hours.
Prerequisite(s): (ME 260 or ME 265) and ENGR 250
Corequisite(s): ME 381L

ME 399 Internship/Co-op 1 Credit Hour
A four-month professional work experience period of the Engineering
Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

ME 410 Finite Element Method with Appl 3 Credit Hours
A presentation of the basic concepts and fundamentals of the Finite
Element Method of Analysis in general, followed by applications to both
continuum and field problems. Selected areas of application: dynamics
and vibration including wave propagation; acoustics; fluid mechanics
including film lubrication and ground water flow; heat transfer; elasticity
and stress/strain analysis including structures; electrical field problems
including electrostatics and electromagnetics (F,W,S).
Prerequisite(s): (ME 345 and (ME 360 or ME 3601) and ME 375*) or
(BENG 370 and BENG 325*)

ME 4191 Structural Mech & Design 4 Credit Hours
A presentation of the methods of plane elasticity to solve a variety of
problems arising in the analysis and design of structures. Review of the
concepts of plane stress and strain, basic equations of plane elasticity
and problems, energy methods approximate/numerical techniques,
estatic-plastic bending and torsion, instability of columns and frames.
(F,W,S).
Prerequisite(s): ME 345 and (ME 361 or ME 360) or
Restricion(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ME 4201 Design of Turbomachinery 4 Credit Hours
Principles of turbomachinery design and practices. Euler's equation
for energy transfer calculations. Two- and three-dimensional velocity
diagrams. Characteristic curves of axial and radial flow compressors.
Design procedures of fans and blowers. Basic design and selection of
pumps. Student is required to conduct a turbomachinery design project
by applying the theory learned from the course. (W).
Prerequisite(s): ME 325 or ME 320
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science
ME 4202  Design Turbo. and Wind Gen.  4 Credit Hours
Principles of turbomachinery design and practices with emphasis on wind power generation. Euler’s equation for energy transfer calculations. Two- and three-dimensional velocity diagrams. Aerodynamics of wind turbines. Wind turbine design and control. Power generation of wind turbines, wind energy system economics and environmental impacts. Design procedures and characteristics of compressors, fans and blowers. Basic design calculations and selection of pumps. A turbomachinery design project by using the theory learned from the course may be required.
Prerequisite(s): ME 375
Restriction(s):
Cannot enroll if Class is Freshman
Can enroll if College is Engineering and Computer Science

ME 423  Thermal Sys Des & Optimization  4 Credit Hours
Design, analysis, and optimization of thermal fluid systems using principles of thermodynamics, fluid mechanics, and heat transfer. Application of thermal sciences in component and system design. Optimized design methodology for improving operations of thermal systems to minimize energy consumption and/or operating costs. (OC)
Prerequisite(s): ME 375*
Restriction(s):
Can enroll if Major is Bioengineering, Mechanical Engineering, Bioengineering

ME 4301  Computational Thermo-Fluids  3 Credit Hours
Prerequisite(s): ME 325 and ME 375*
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Engineering and Computer Science

ME 4361  Design of HVAC Systems  4 Credit Hours
A comprehensive treatment of the design principles and practices in the heating, ventilating, and air conditioning. Psychrometrics, design loads, distribution systems, equipment selection.
Prerequisite(s): (ME 325 or ME 320 or ME 3251 or ME 3252) and (ME 375* or ME 371*)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ME 440  Intro to Mechanical Vibrations  3 Credit Hours
This introductory course on mechanical vibrations covers theories with applications, which include free and forced vibration analysis of damped and undamped, discrete (ranging from single to multi-degree-of-freedom), and simple continuous structures (such as strings, shafts, and beams), and design of vibration absorbers. Students may not receive credit for both ME 440 and ME 4461. (YR)
Prerequisite(s): ME 345 and ME 349
Restriction(s):
Can enroll if Major is Mechanical Engineering, Manufacturing Engineering, Bioengineering

ME 442  Control Syst Anly and Design  4 Credit Hours
Prerequisite(s): ECE 305 and ME 345
Corequisite(s): ME 442L

ME 444  Sound and Noise Controls  4 Credit Hours
Full Course Title: Introduction to Sound and Noise Controls
This course covers basic topics in sound theory, applications, and noise control system design. Topics include sound generation, radiation and transmission, human hearing system mechanism, sound quality metrics, design of silencers, mufflers and resonator, audio system and speaker design, building acoustics, acoustical material properties and material testing, sound measurement, and octave band analysis. The student is required to conduct a course project related to noise control system design. Students may not receive credit for both ME 444 and ME 4461. (YR)
Prerequisite(s): (ME 265 and BENG 351) or (ME 345 and ME 349)
Restriction(s):
Can enroll if Major is Mechanical Engineering, Manufacturing Engineering, Bioengineering

ME 4461  Mech Vibratio & Noise Control  4 Credit Hours
Fundamentals of mechanical vibration and principles of noise control. Use of transducers and instruments to conduct sound and vibration measurements. Free and forced vibration in single and multiple degrees-of-freedom systems, damping, eigenvalues, eigenvectors, frequency response function, modal analysis, description of sound fields, acoustical materials and material testing, acoustics of rooms and enclosures, sound quality, and principles of noise control. Students will be required to conduct either a vibration or a noise control project. Two one-and-one-half hour lectures and one three-hour laboratory. (F).
Prerequisite(s): ME 345 and (ME 349* or ME 348*)
Corequisite(s): ME 4461L
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Level is Undergraduate
Can enroll if College is Engineering and Computer Science

ME 4471  Solar Energy Sys Analy&Design  4 Credit Hours
The course introduces students to the fundamentals of solar energy conversion and solar energy systems. Principles in thermodynamics and heat transfer required to understand the solar energy use is reviewed. Design of different types of solar energy systems are explored and assessed. Issues relating to the practical implementation of solar energy will also be considered.
Prerequisite(s): ME 325 and ME 375*
Restriction(s):
Can enroll if Class is Senior
Can enroll if Major is, Mechanical Engineering, Bioengineering
ME 452 Sustainable Energy & Environ 4 Credit Hours
This course introduces students to the fundamentals of energy sources and their environmental impacts. It covers a wide range of conventional and alternative energy sources, which includes renewable and presents the tools for assessing their sustainability and environmental impacts. It also reviews issues related to energy storage, transportation and distribution, and challenges and future opportunities. A course project involving design of practical plans of implementation of sustainable energy technologies will be assigned.
Prerequisite(s): ME 325 and ME 375*
Restriction(s):
Can enroll if Class is Senior
Can enroll if College is Engineering and Computer Science

ME 4521 Intro Sust Energy Systems 3 Credit Hours
The course provides an overview of energy technology from a broad perspective that encompasses technical and environmental aspects. It covers a wide range of traditional and alternative energy sources and presents assessments of their availability, sustainability, and environmental impacts as well as evaluation of their potential role in solving the global energy problem.
Prerequisite(s): ME 375
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ME 460 Design for Manufacturing 3 Credit Hours
Design decisions based on manufacturability and process-property relationships. Design for assembly. Manufacturing tolerances and quality control methods including NDT. Design methodology used for product development.
Prerequisite(s): (ME 360 or ME 3601) and ME 381

ME 4671 Senior Design 1 4 Credit Hours
A guided design project with emphasis on the decision-making process associated with establishing alternatives and evaluation procedures to synthesize designs. Students propose design projects and work in teams to produce analytical designs, conduct evaluative experiments, and construct a physical design prototype. Engineering ethics and responsibility. Written and oral presentations are required at the close of the term. (F,W,S).
Prerequisite(s): ME 345 and (ME 360 or ME 3601) and (ME 375 or ME 371) and (ME 378* or ME 379*)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is Mechanical Engineering

ME 4681 ME/BENG Dual Senior Design 4 Credit Hours
Full Title: Interdisciplinary Senior Design for ME/BENG Dual Degree Students A guided interdisciplinary design project course where student teams propose design projects, design a device, system or process related to mechanical-and bio-engineering and conduct evaluative experiments and/or construct a physical prototype. Engineering ethics and responsibility. At the end of the semester, the students are required to submit written reports and give oral presentations with a demonstration of their projects. Credit can only be awarded for one of the following courses: BENG 4671, ME 4671, and ME 4681. (W)
Prerequisite(s): BENG 351 and BENG 370 and BENG 364 and ME 375 and (BENG 375 or BENG 381)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is
ME 490  Directed Design Project  1 to 3 Credit Hours
Design project involving not only design but also analysis, fabrication and/or testing. Topics may be chosen from any of the areas of mechanical engineering. Students who have taken ME 425 and ME 464 will be encouraged to take this course. The student will submit a report on his or her project and give an oral presentation at the close of the term. (F,W,S).
Prerequisite(s): ME 360 or ME 381 or ME 425 or ME 464
Restriction(s):
Can enroll if Class is Senior or Graduate

ME 491  Directed Research Problems  1 to 3 Credit Hours
Special problems selected for laboratory or library investigation with intent of developing initiative and resourcefulness. (F,W,S).
Restriction(s):
Can enroll if Class is Senior or Graduate

ME 492  Guided Study in Mech Eng  1 to 3 Credit Hours
Individual study, design or laboratory research in a field of interest to the student. Topics may be chosen from any of the areas of mechanical engineering. The student will submit a report on his or her project at the close of the term. (F,W,S).
Restriction(s):
Can enroll if Class is Senior or Graduate

ME 493  Advanced Vehicle Energy Sys  3 Credit Hours
This course will introduce the advanced energy conversion systems in automotive vehicles and cover the fundamentals, characteristics, and design consideration of the energy systems. The topic includes using alternative fuels in internal combustion engines, advanced power train systems in hybrid, electric, and fuel cell vehicles, and exhaust recovery systems.
Prerequisite(s): ME 325* and ECE 305*
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if College is Engineering and Computer Science

ME 496  Internal Combustion Engines I  2 to 3 Credit Hours
Comparison of characteristics and performance of several forms of internal combustion engines including the Otto and diesel types of piston engines and the several types of gas turbines; thermodynamics of cycles, combustion, ignition, fuel metering and injection, pollution from engines and modeling techniques. Lectures, theory demonstrations, and experiments.
Prerequisite(s): (ME 320 and ME 330) or ME 325

ME 4981  Automotive Engineering  4 Credit Hours
Analysis of vehicle performance in terms of acceleration, gradability, speed, fuel economy, ride comfort, stability and safety. Engine-transmission compatibility and matching. Fundamental vehicle dynamics. Computer modeling and simulation of vehicle systems by numerical techniques. Transmission ratio and torque analysis. Design of vehicle systems such as brakes, suspensions, drive line components, steering mechanisms and other subsystems. Four hours lecture. (F,W).
Prerequisite(s): ME 345 and (ME 360 or ME 3601)
Restriction(s):
Can enroll if Class is Junior or Senior
Can enroll if Major is , Mechanical Engineering, Bioengineering

ME 499  Internship/ Co-Op  1 Credit Hour
A four-month professional work experience period of the Engineering Internship Program, integrated and alternated with the classroom terms.
Restriction(s):
Can enroll if Class is Senior or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Practical Aspects of Computer Security
The PACS undergraduate certificate will provide students with essential computer science concepts, basic security principles, and the tools and experience necessary for an entry-level position in IT-Security. This certificate provides a foundational knowledge in computer security principles, firewalls, malware, intrusion detection, physical security, wireless network security, mobile device security, social network security, and web application security.

The PACS undergraduate certificate is comprised of 4 courses (15 credit hours) delivered in a web-based format. All 15 credit hours are transferable into the College of Engineering and Computer Science’s Computer & Information Science (CIS) or Cybersecurity and Information Assurance (CIA) B.S. degrees. This certificate is distinctly unique in that it creates a pathway for a student to receive a credential before transitioning into the degree program.

Any individual interested in advancing their knowledge in computer security principles, firewalls, malware, intrusion detection, physical security, wireless network security, mobile device security, social network security, and web application security will benefit from this program.

Data from the US Bureau of Labor Statistics indicates that job growth projections will increase 12% through the year 2022 for individuals with backgrounds in computer security. However, with the increase in cloud computing, this percentage has the potential to be even higher. As the utilization of information technology increases, there is also anticipated job growth in the healthcare industries. This growth, coupled with the impending federal government hiring regulations for military veterans, makes the job prospects extremely favorable for students who possess this credential.

Certificate Requirements
This web-based 15 credit hour certificate is comprised of 3 required core CIS courses, along with an applications course in practical computer security.

Applicants should have completed a math course equivalent to Calculus 1 (MATH 115) or have received College Level Exam Program (CLEP) credit for Calculus 1. It is also possible to take Calculus 1 (MATH 115) concurrently with CIS 150. Students who have not completed the calculus prerequisite have the option to take the UM-Dearborn Math Placement Test and complete the required mathematic courses as part of the certificate program.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 150</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
<td>4</td>
</tr>
</tbody>
</table>
Robotics Engineering

With recent advances in computer hardware and software, as well as 3D printing, the field of robotics is entering a new phase where robots are smaller, faster, cheaper, and smarter. These next generation robots will have applications in a wide variety of fields, including manufacturing, medicine, education, entertainment, military applications, etc.

The Bachelor of Science in Engineering (B.S.E.) in Robotics Engineering program requires a total of 125 credit hours. The program is designed to provide students with an understanding of important concepts in Robotics, Electrical and Computer Engineering, Systems Engineering, and Mechanical Engineering, as well as an ability to apply these concepts to design robots and robotic systems for diverse applications.

The educational objectives of the Robotics Engineering program are to develop graduates who possess:

- Good design skills, the ability to formulate problems; design experiments; collect, analyze, and interpret data; evaluate material, computational, and management resources needed to solve typical problems
- The ability to work in multidisciplinary teams and communicate effectively
- The ability to pursue graduate studies as well as a research career in industry, government, or academia
- Hands-on experience with commonly used industry standard software and hardware tools
- A good awareness of professional responsibility, ethics, and the need to engage in life-long learning
- A strong preparedness to meet regional needs, including the automotive, construction, defense-related, life-sciences, and power industries, consistent with the University’s mission
- A strong grounding in the principles and methods of robotics engineering, including robots, robotic systems, computers and control systems, and the ability to apply these in systems, products, and applications.

Program Educational Objectives

The objective of the Bachelor of Science Engineering in Robotics Engineering degree programs are to:

1. Achieve professional growth in an engineering position in regional and national industries. Growth can be evidenced by promotions and appointment in the workplace (management positions, technical specialization), entrepreneurial activities, and consulting activities.
2. Success in advanced engineering studies evidenced by enrollment in graduate courses, completion of graduate degree programs, presentations and publications at professional events, and awards or licences associated with advanced studies.
3. Realization of impactful achievements in societal roles demonstrated by attainment of community leadership roles, mentoring activities, civic outreach service, and active roles in professional societies.

Program Outcomes

The Robotics Engineering program is designed to demonstrate that graduates of the program have:

a. an ability to apply knowledge of mathematics, science, and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs
d. an ability to work cooperatively on multi-disciplinary projects
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility

g. proficiency in oral and written communications
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a clear understanding that lifelong learning is essential for sustained professional development
j. a knowledge of contemporary issues and its impact on the engineering profession
k. an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program: The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

Foundational Studies

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Areas of Inquiry

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)
- Lecture/Lab Science Course
- Additional Science Course
Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

Capstone
Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

Major Requirements
In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a BSE degree in Robotics Engineering from UM-Dearborn.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Prin: Macroeconomics (ECON 201 or 202 also fulfill 3 credits of DDC Social and Behavioral Analysis)</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 202</td>
<td>Prin: Microeconomics</td>
<td>4</td>
</tr>
<tr>
<td>ENT 400</td>
<td>Entreprenurial Thinking&amp;Behav (Also fulfills 3 credits of DDC Intersections)</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Intro to Eng and Computers</td>
<td>2</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>MATH 215</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Diff Eqns with Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 134/144</td>
<td>General Chemistry IA</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 150</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>General Physics II</td>
<td>4</td>
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<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 276</td>
<td>Discrete Math Meth Comptr Engr</td>
<td>4</td>
</tr>
<tr>
<td>or ECE 276</td>
<td>Discrete Math in Computer Engr</td>
<td>4</td>
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</table>

**ECE Core Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ECE 210</td>
<td>Circuits</td>
<td>4</td>
</tr>
<tr>
<td>ECE 270</td>
<td>Computer Methods in ECE I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 273</td>
<td>Digital Systems</td>
<td>4</td>
</tr>
<tr>
<td>ECE 311</td>
<td>Electronic Circuits I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3731</td>
<td>Microproc and Embedded Sys</td>
<td>4</td>
</tr>
</tbody>
</table>

**RE Core Courses**

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<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>ECE 347</td>
<td>Applied Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3641</td>
<td>Robotics I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 371</td>
<td>Analog &amp; Discrete Sig &amp; Sys</td>
<td>4</td>
</tr>
<tr>
<td>ECE 370</td>
<td>Adv Soft Techn in Comp Engr</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 381</td>
<td>Industrial Robots</td>
<td>4</td>
</tr>
</tbody>
</table>

**Professional Electives**
Select two courses from the following list: 6

- CIS 479 | Intro to Artificial Intel | 4            |
- or ECE 479 | Artificial Intelligence | 4            |
- ECE 434 | Machine Learning in Engin | 4            |
- ECE 471 | Comp Networks/Data Comm | 4            |
- ECE 473 | Embedded System Design | 4            |
- ECE 480 | Intro to Dig Signal Processing | 4            |
- ECE 4881 | Introduction to Robot Vision | 4            |
- ECE 4951 | Sys Design and Microcontrollers | 4            |
- ECE 491 | Directed Studies | 4            |
- IMSE 489 | Robotics Systems Simulation | 4            |
- ME 3601 | Des and Analy of Mach Elem | 4            |
- ME 472 | Prin & Appl of Mechatronic Sys | 4            |

**Approved Electives**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>ECE 319</td>
<td>Electromagnetic Compatibility</td>
<td>4</td>
</tr>
<tr>
<td>ECE 375</td>
<td>Intro to Comp Architecture</td>
<td>4</td>
</tr>
<tr>
<td>ECE 385</td>
<td>Elec Materials and Devices</td>
<td>4</td>
</tr>
<tr>
<td>ECE 414</td>
<td>Electronic Systems Design</td>
<td>4</td>
</tr>
<tr>
<td>ECE 415</td>
<td>Power Electronics</td>
<td>4</td>
</tr>
<tr>
<td>ECE 428</td>
<td>Cloud Computing</td>
<td>4</td>
</tr>
<tr>
<td>ECE 433</td>
<td>Intr to Multimedia Technolgies</td>
<td>4</td>
</tr>
<tr>
<td>ECE 434</td>
<td>Machine Learning in Engin</td>
<td>4</td>
</tr>
<tr>
<td>ECE 435</td>
<td>Intro to Mobil/Smrt Dev &amp; Tech</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4361</td>
<td>Electric Machines and Drives</td>
<td>4</td>
</tr>
<tr>
<td>ECE 438</td>
<td>Web Engr: Prin &amp; Tech</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4432</td>
<td>Renewable Elec Pwr Sys</td>
<td>4</td>
</tr>
<tr>
<td>ECE 450</td>
<td>Analog and Digital Comm Sys</td>
<td>4</td>
</tr>
<tr>
<td>ECE 475</td>
<td>Comp Hardware Org/Design</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 492</td>
<td>Exper Honors Directed Research</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 493</td>
<td>Exper Hnrs Dir Dsgn</td>
<td>2</td>
</tr>
</tbody>
</table>

**Software Engineering**

Software Engineering is the computer discipline that is concerned with the theoretical and practical aspects of building high quality software systems, on time, and within budget. Software engineers are tasked with the detailed analysis, design, implementation, testing, maintenance and
management of software product development projects for a broad range of computing applications across society.

The increasing pressure to deliver high-quality, reliable software products in less time is rapidly fueling the demand for computer professionals with specific preparation in software engineering and experience in working on teams. These pressures stem from such widespread development as

- The use of software for demanding and safety-critical applications that make it imperative to avoid the serious, indeed sometimes fatal, consequences of poorly understood design.
- The need to create consumer and entertainment applications like computer games, in the face of a highly competitive global market place.
- The increasing need to develop useful, easy-to-use software tools that reliably meet customer needs and whose features and documentation can be used and understood by their intended user with a high degree of consistency and confidence.
- The need to re-engineer or replace aging legacy systems to take advantage of modern computer hardware capabilities.

Recent advances in the practice and technology of software engineering have made it possible to offer undergraduate and graduate degree programs in software engineering itself. Notable among these advances are:

- The availability of proven computer tools (such as CASE tools) and processes (such as the Personal Software Process) to standardize and automate software development.
- The increasing importance of formal methods and software quality measurement techniques to ensure more thorough testing of software.
- The success of the agile and object-oriented software engineering methods, as well as the move toward technical and managerial practices that cover the full software development cycle.

Software engineers must know the subset of computer science that is relevant to software development. They must also have knowledge of the principles of effective and reliable design, of mathematics and other sciences that are traditionally known by engineers, and of the skills and applications of project management.

Software engineering includes:

- Software design and development; that is, building commercial, industrial-strength software by the application of validated knowledge and experience that have been codified into formal methods of best practices.
- Software process and quality assurance; that is, the systematic discipline of consciously improving the quality, cost and timeliness of the process itself by which large software systems are designed and developed.
- Software development project management; that is, how to manage large software design projects and bring development to a timely and efficient completion.

The software engineering degree program offered by the Department of Computer and Information Science stresses the range of technical, systematic, and managerial aspects of the software engineering process but places primary emphasis on the technical facets of designing, building, and modifying large and complex software systems. This program concentrates on all software development lifecycle phases, including: program management, requirements engineering, software architecture design, software implementation, software configuration management, software quality assurance, and software process maturity measurements and improvements. It balances both theoretical and practical aspects by covering fundamentals in the classroom and evaluating student knowledge by implementing team-based work projects. Students complete a minimum of 120 credits and receive a BS degree in Software Engineering. The degree prepares graduates for immediate employment in the software engineering field and for graduate study.

The Bachelor of Science in Software Engineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org

415 North Charles Street,
Suite 1050,
Baltimore, MD 21201
Telephone: (410) 347-7700.

Program Objectives

1. Our graduates will be successfully employed in software engineering-related field or another career path, in an industrial, commercial, academic, governmental, or non-governmental organization, or will be a successful graduate student in a program preparing them for such employment.
2. Our graduates will lead and participate in culturally diverse teams, become global collaborators and adapting to an ever-changing field.
3. Our graduates will continue professional development by obtaining continuing education credits, professional registration or certifications, or post-graduate study credits or degrees.

Program Outcomes

1. An ability to apply knowledge of mathematics, science, and engineering;
2. An ability to design and conduct experiments, as well as to analyze and interpret data;
3. An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
4. An ability to function on multidisciplinary teams;
5. An ability to identify, formulate, and solve engineering problems;
6. An understanding of professional and ethical responsibility;
7. An ability to communicate effectively;
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
9. A recognition of the need for, and an ability to engage in, life-long learning;
10. A knowledge of contemporary issues;
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
12. An ability to program.
13. An ability to manage a project.

Dearborn Discovery Core Requirement

The minimum GPA for the program is 2.0. In addition, the DDC permits any approved course to satisfy up to three credit hours within three different categories. Please see the General Education Program:
The Dearborn Discovery Core (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/) section for additional information.

**Foundational Studies**

Written and Oral Communication (GEWO) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewo)

Upper Level Writing Intensive (GEWI) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gewi)

Quantitative Thinking and Problem Solving (GEQT) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geqt)

Critical and Creative Thinking (GECC) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gecc)

Social and Behavioral Analysis (GESB) – 9 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gesb)

Humanities and the Arts (GEHA) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#geha)

Intersections (GEIN) – 6 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gein)

**Areas of Inquiry**

Natural Science (GENS) – 7 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gens)

- Lecture/Lab Science Course
- Additional Science Course

**Capstone**

Capstone (GECE) – 3 Credits (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/general-information/general-education-program-dearborn-discovery-core/#gece)

**Major Requirements**

A candidate for the degree Bachelor of Science in Software Engineering is required to pursue scholastic quality and to complete satisfactorily the following program of study:

In addition to completion of the Dearborn Discovery Core, the following courses are required to earn a BS degree in Software Engineering from UM-Dearborn.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 270</td>
<td>Tech Writing for Engineers (Also fulfills 3 credits of DDC Written and Oral Communication)</td>
<td>3</td>
</tr>
</tbody>
</table>

**General Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 115</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 116</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 275</td>
<td>Discrete Structures I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 306</td>
<td>Discrete Structures II</td>
<td>4</td>
</tr>
<tr>
<td>IMSE 317</td>
<td>Eng Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

**Laboratory Science Sequence**

Select two courses, 8 credits, in one sequence from:

<table>
<thead>
<tr>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130 &amp; BIOL 140 Intro Org and Environ Biology</td>
<td>8</td>
</tr>
<tr>
<td>CHEM 134 &amp; CHEM 136 General Chemistry IA</td>
<td></td>
</tr>
<tr>
<td>GEOL 118 &amp; GEOL 218 Physical Geology &amp; Historical Geology</td>
<td></td>
</tr>
<tr>
<td>PHYS 125 &amp; PHYS 126 Introductory Physics I &amp; II</td>
<td></td>
</tr>
<tr>
<td>PHYS 150 &amp; PHYS 151 General Physics I &amp; II</td>
<td></td>
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</tbody>
</table>

**Mathematics**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 130 Introduction to Astronomy</td>
<td>4</td>
</tr>
<tr>
<td>ASTR 131 &amp; ASTR 132 and Intro Astronomy Lab</td>
<td></td>
</tr>
<tr>
<td>BIOL 130 Intro Org and Environ Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 140 Intro Molec &amp; Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>CHEM 134 General Chemistry IA</td>
<td></td>
</tr>
<tr>
<td>CHEM 136 General Chemistry IIA</td>
<td></td>
</tr>
<tr>
<td>CHEM 144 Gen Chemistry IB</td>
<td></td>
</tr>
<tr>
<td>CHEM 146 General Chemistry IIB</td>
<td></td>
</tr>
<tr>
<td>CHEM 225 Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 226 Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CHEM 227 Organic Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 118 Physical Geology</td>
<td></td>
</tr>
<tr>
<td>GEOL 218 Historical Geology</td>
<td></td>
</tr>
<tr>
<td>PHYS 125 Introductory Physics I</td>
<td></td>
</tr>
<tr>
<td>PHYS 126 Introductory Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 150 General Physics I</td>
<td></td>
</tr>
<tr>
<td>PHYS 151 General Physics II</td>
<td></td>
</tr>
</tbody>
</table>

**ECON 201** Prin: Macroeconomics (Also fulfills 3 credits of DDC Social and Behavioral Analysis)

**Business Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>OB 354</td>
<td>Behavior in Organization (Also fulfills 3 credits DDC Social and Behavioral Analysis)</td>
<td>3</td>
</tr>
</tbody>
</table>

**CIS Core**

Seven computer and information science courses are required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 150</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 200</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 310</td>
<td>Computer Org and Assembly Lang</td>
<td>4</td>
</tr>
<tr>
<td>CIS 3501</td>
<td>Data Struc &amp; Alg Anlys for SE</td>
<td>4</td>
</tr>
<tr>
<td>CIS 375</td>
<td>Software Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 427</td>
<td>Comp Networks and Dis Process</td>
<td>4</td>
</tr>
<tr>
<td>CIS 450</td>
<td>Operating Systems</td>
<td>4</td>
</tr>
</tbody>
</table>
Software Engineering Requirements
CIS 285 Software Engineering Tools 3
CIS 376 Software Engineering II 4
CIS 476 Soft Arch & Design Patterns 3
CIS 4961 Design Seminar for SE I 2
CIS 4962 Design Seminar for SE II 2

One Application Sequence
Select 7-9 credit hours:

Information Systems Sequence
CIS 425 Information Systems 4
CIS 447 Intro Computr & Ntwrk Security 3

Computer Game Design Sequence
CIS 297 Intro to C Sharp 2 3
CIS 487 Computer Game Design & Implem 3
CIS 488 Computer Game Design II 3

Web Engineering Sequence
CIS 421 Database Mgmt Systems 4
Take one of the following two courses:
CIS 435 Web Technology 3
CIS 436 Mobile App Des & Impl 3

Technical Electives
Select 5-7 additional credits from the following. Only one course from 5-7
CIS 296, CIS 297 or CIS 298 may be used towards the 120 credits of
the degree:
CIS 296 Java Programming
CIS 297 Intro to C Sharp
CIS 298 Intro to Python
CIS 316 Prac. Comp. Sec.
CIS/IMSE 381 Industrial Robots
CIS 387 Digital Forensics I
CIS 400 Programming Languages
CIS 405 Algorithm Analysis & Design
CIS 411 Natural Language Processing
CIS 421 Database Mgmt Systems
CIS 423 Dec Support and Exp Systems
CIS 425 Information Systems
CIS 435 Web Technology
CIS 436 Mobile App Des & Impl
CIS 437 Advanced Networking
CIS 447 Intro Computr & Ntwrk Security
CIS 449 Intro to Software Security
CIS 451 Computer Graphics
CIS 452 Inf Vis & Multimedia Gaming
CIS 467 Digital Forensics II
CIS 474 Compiler Design
CIS 479 Intro to Artificial Intel
CIS 487 Computer Game Design & Implem
CIS 488 Computer Game Design II
ECE 372 Intro to Microprocessors
ECE 473 Embedded System Design
ENGR 399 Experiential Honors Prof. Prac
ENGR 492 Exper Honors Directed Research

ENGR 493 Exper Hnrs Dir Dsgn

Only one of the following three courses:
ENGR 360 Des Inovtn: Proc, Meth & Prct
ENGR 400 Appl Business Tech for Engr
ENT 400 Entrepreneurial Thinking&Behav

General Electives
As needed to get a minimum 120 credits for graduation

Special Programs

Officer Education Programs
Students at UM-Dearborn may apply for admission to the two-year and
four-year programs of Army or Air Force officer training. These programs
include some scholarship options and may lead to a commission either in
the Army or the Air Force.

These officer training programs are based in Ann Arbor. Interested
students may get further information by visiting the Office of the
Registrar in Dearborn (1169 UC) or by telephoning Ann Arbor: for Air Force
information, telephone (734) 764-2403; for Army information, telephone
(734) 764-2400.

Army Officer Education Program (ROTC) (Not a
Concentration)
Upon graduation from the University and successful completion of the
program, students enrolled in the Army Officer Education Program receive
a commission as second lieutenant in the United States Army Reserve or
in the Regular Army. Many students enroll for the first two years in order
to sample career opportunities. No military obligation is incurred for the
first two years.

Air Force Officer Education Program
The program offers studies designed to prepare and commission
selected individuals to serve in the United States Air Force. Both a four-
year and a two-year program leading to a commission as a second
lieutenant are offered. The four-year plan comprises eight terms of
courses in aerospace studies plus a four-week field training course at an
Air Force base, between the sophomore and junior years. The two-year
plan comprises an initial six-week field training course followed by four
terms of aerospace studies (AS 310 through AS 411 series). Cadets may
enroll in either the four-year or two-year program by permission of the
chairman.

Military Obligation
After being commissioned, graduates of the program are called to active
duty with the Air Force in a field usually related to their academic degree
program. The period of service is four years for non-flying officers, five
years for navigators after navigator training, and eight years for pilots
after flight training. A contractual obligation is established for non-
scholarship students when they attend the first Professional Officer
Course (POC). Scholarship students in the four-year program incur a
UM-Dearborn Credit for Military Officer Education

College of Arts, Sciences, and Letters
Up to six credit hours of Military Science / Aerospace Studies / ROTC coursework may count as elective credit toward degree.

College of Business
Up to six semester credit hours will be granted to a student for successful completion of advanced military science courses towards the BBA degree requirements.

College of Engineering and Computer Science
Students who satisfactorily complete the requirements as established by the Military Officer Education Program Chairman for a commission and satisfactorily complete the engineering program of studies may count a maximum of four credit hours of advanced military science courses (300 and 400 level) as meeting program elective hours for an engineering degree at the discretion of the academic department.

College of Education, Health, and Human Services
Courses do not carry credit toward degree requirements.

Honors Program
The Honors Program at UM-Dearborn is designed for qualified, highly-motivated students who want an extra level of challenge and stimulus in their college experience. Honors students take a special sequence of classes that satisfy basic requirements and at the same time provide a well-balanced undergraduate education. The program teaches students to think critically and independently, to perceive connections between diverse areas of knowledge, and to express their thoughts clearly and effectively. Honors Program classes are small, enabling students to interact closely with the faculty and each other. Because of the small size of the Honors classes and the emphasis on active participation, students in the program gain close personal contact with their professors from the beginning of the freshman year. The instructors in the Honors Program are highly dedicated teachers. Many have won UM-D’s Distinguished Teaching Award. All are committed to the ideal of relaxed and collegial relations between students and professors. The Honors faculty are readily available to Honors students for academic advising and for informal conversation. The core of the Honors Program is a carefully planned sequence of courses. Instead of taking a smattering of classes in unrelated areas, students in the program complete their basic college requirements with courses that form an integrated and coherent curriculum. Apart from their Honors requirements, Honors students follow a normal course of study in their own area of concentration, together with the other students in their unit. They are required to maintain a cumulative grade point average of no less than 3.2 to remain in the Honors program. Any student falling below an overall average of 3.2 at the end of any given semester will be assigned probationary status in the Honors program for the succeeding semester. Failure to improve the overall average to 3.2 or above during that probationary semester will result in dismissal from the Program. Honors students have a special niche within the college community. They get to know each other and build close friendships because they take many of the same courses together. The program regularly sponsors social hours and organizes group outings to concerts, plays and museums. Students and faculty in the program get to share valuable experiences outside the classroom.

The Honors Program at UM-Dearborn is open to all entering freshmen with a high school GPA of at least 3.5, Composite ACT 25 or SAT 1200 other evidence of superior academic ability. The program accepts students from all units on campus, including CASL, Engineering, Education, Health, and Business students. Admission to the program is competitive and is based on the student’s interests and experience as well as the high school record.
The University of Michigan, as an Equal Opportunity/Affirmative Action employer, complies with applicable federal and state laws regarding nondiscrimination and affirmative action, including Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973. The University of Michigan is committed to a policy of nondiscrimination and equal opportunity for all persons regardless of race, sex, color, religion, creed, national origin or ancestry, age, marital status, sexual orientation, gender identity, gender expression, disability, or veteran status in employment, educational programs and activities, and admissions. Inquiries or complaints may be directed to:

Senior Director for Institutional Equity and Title IX/Section 504
Coordinator
Office of Institutional Equity
2072 Administrative Services Building
Arbor, Michigan 48109-1432
734-763-0235
TTY 734-647-1388

University of Michigan-Dearborn inquiries may be addressed to the:

Dearborn Institutional Equity Officer
Office of Institutional Equity
1020 Administration Building
Dearborn, Michigan 48128-2406
313-593-5666
TTY 313-593-5430
fax 313-593-3568

The UM-Dearborn Catalog is a fundamental source of information concerning academic opportunities, policies, regulations, and procedures. It is each student’s responsibility to become familiar with the information contained herein.

All data in this catalog reflect information as it was available at the publication date. The University of Michigan-Dearborn reserves the right to revise any content contained in this publication at its discretion and to make reasonable changes in requirements as approved by official action of the University of Michigan-Dearborn University Curriculum and Degree Committee. Except in the case of error or unless otherwise noted, approved changes made to program and degree requirements become effective the appropriate fall semester and apply to all students admitted to the University for that academic year.

Requirements for a degree are based on the regulations and requirements in effect at the time students initially registered at the University of Michigan-Dearborn as a degree-seeking student. Students must satisfy degree requirements in effect at the time of their admission to the University of Michigan-Dearborn. Students who select a major and/or minor offered in a catalog subsequent to their original admission at the University of Michigan-Dearborn must follow the catalog in effect at the time of the selection.

Students who do not attend for one calendar year must be readmitted to the University through their Academic Unit and must satisfy degree and program requirements in effect at the time of their readmission.

Courses A-Z

Accounting (ACC)

ACC 505  Devel & Interp Financial Info  3 Credit Hours
Students learn how financial information is developed, interpreted and utilized in business. This is accomplished by studying financial accounting tools and estimation methods used for interpretation and managers' decisions relating to investing, financing, and operating activities. Topics include financial information development and analysis, accounting estimation techniques, and cash flow analysis. Financial accounting methodology with respect to the sales and receivables cycle, inventory, property, plant and equipment, liabilities, corporate equity and initial public offerings, and investments in other corporate entities are studied. Cases requiring critical analysis and interpretation may be integrated throughout the course.

Restriction(s):
Can enroll if Class is Graduate

ACC 514  Financial Reporting  3 Credit Hours
This course covers detailed financial statements, the theoretical foundations behind those statements and how the various transactions are reported on those statements. These transactions include financing through various ownership and debt instruments, off-balance-sheet financing and leverage; investing in tangible and intangible operating assets; investing in financial instruments for return and risk management purposes; and investing in financial instruments to influence or control operations of other business units. Specifically, the course will review the accounting process and examine in detail the Income Statement, Balance Sheet and Statement of Cash flows including a study of the basics of revenue recognition, a detailed study of accounting for inventory, accounting for the life cycle of capital investments in non-current assets, various debt topics such as short term loans and payroll, as well as how companies account for long term debt and equity changes. These operating, financing and investing issues will be considered based on today's international business environment. (OC)

Prerequisite(s): ACC 505 or ACC 298

Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 516  Advanced Accounting  3 Credit Hours
To study selected advanced accounting topics which may include partnerships, business combinations, consolidated financial statements, multinational accounting and reporting, accounting for financial distress situations and regulation of accounting by the SEC. Students will not receive credit for both ACC 416 and ACC 516.

Prerequisite(s): ACC 357 or ACC 514

Restriction(s):
Can enroll if Program is MSA-Accounting
ACC 520  Comm for Acct and Tax Prof  3 Credit Hours
The ability to communicate effectively is an important skill for the tax professional. This course develops this important skill in tax compliance and tax planning settings through a series of case studies. Emphasis will be placed on effectively communicating technical aspects of the tax law to management, clients, and other professional tax situations. Students cannot receive credit for both ACC 630 and ACC 520.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

ACC 539  Not-for-Profit Accounting  3 Credit Hours
To study the principles and procedures of accounting for not-for-profit entities. Topics may include: state and local government financial accounting, financial accounting for selected other entities, managerial concepts and current issues. Student will not receive credit for both ACC 439 and ACC 539.
Prerequisite(s): ACC 356 or ACC 505
Restriction(s):
Can enroll if Program is MSA-Accounting

ACC 555  Cost Management  3 Credit Hours
To introduce how cost and managerial accounting concepts and techniques can be applied to fully utilize information created by contemporary accounting information systems. The theoretical and empirical nature of cost management reports, their structures and contents, are emphasized with the goal of highlighting the relevance and limitations of this information in decision making. The course gives consideration to global and individual responsibility center performance by covering such topics as product costing, control standards, cost allocation, pricing, quality, short-term and long-term budgeting, and performance evaluation. In addition, the reciprocal roles of accounting and technology in enhancing efficiency and effectiveness benchmarks are investigated. Interwoven into course coverage are ethical, diversity, critical thinking, and global dimensions of business. This course also integrates emerging issues and techniques to assist managers and consultants in the accounting, finance, marketing, and human resources arenas.
Prerequisite(s): ACC 505
Restriction(s):
Can enroll if Class is Graduate

ACC 557  Auditing  3 Credit Hours
To study generally accepted auditing standards, internal control, principal audit objectives, the structure of audit programs, audit procedures, professional legal liability, ethical standards, statistical sampling techniques, the audit of EDP systems, auditors report and management letters. (OC)
Prerequisite(s): ACC 505 or ACC 298
Restriction(s):
Can enroll if Class is Graduate

ACC 560  Intro Federal Income Taxation  3 Credit Hours
Full Title: Introduction to Federal Income Taxation Survey analysis of the basic framework utilized in measuring and reporting taxable income of individuals and business entities including gross income, deductions, tax rates ,credits, timing issues and procedural matters. (OC)
Prerequisite(s): ACC 505 or ACC 298
Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 580  Accounting Information Systems  3 Credit Hours
Accounting uses techniques to take raw data and convert it into information that is useful to managers and investors. But is it possible to convert data into information without knowing what it relates to, where and how it was gathered and what its limitations are? We will address these questions as we study accounting information systems. To begin, we focus on how data for typical business processes is captured and processed in a computerized accounting system using relational databases. We'll then learn how to describe an organization's accounting-related processes in a professionally rigorous way via documentation using tools used in the profession. We'll finish by learning how to analyze accounting processes to find control weaknesses in them that might allow them to generate unreliable data that could compromise the assets or liabilities of the firm or the decisions made by accountants, the managers they support or investors. (OC)
Prerequisite(s): ACC 505 or ACC 298
Restriction(s):
Can enroll if Class is Graduate

ACC 600  Financial Accounting Theory  3 Credit Hours
This course provides an overview of 1) various approaches to accounting theory formulation (including traditional, regulatory, events, behavioral, information processing, predictive, and positive approaches), and 2) alternative asset valuation and income determination models (including historical cost, replacement cost, net realizable value, and present value models, along with the impacts of price level adjustments). Particular attention is directed at how these various approaches impact the state of the art of Accounting and how they influence the future evolution of Accounting. Additionally, the course provides for exploration and critical examination of the evolution and present state of the Financial Accounting Standards Board conceptual framework. The nature of the topics covered will enhance understanding of current and developing generally accepted accounting principles.
Prerequisite(s): ACC 356
Restriction(s):
Can enroll if Class is Graduate

ACC 601  Information Tech Auditing  3 Credit Hours
With the increased capabilities of IT have come new risks for firms and or their auditors. Audit firms are finding that they can no longer audit ‘around the computer’. This requires CPAs to understand the types of risk arising in IT-based systems and consider their impact on a clients’ business and the audit. This course introduces you to these types of risk, the implications these risks have for the traditional audit and the other services public accountants provide to address IT-based risks. IT is also a powerful tool that accountants and auditors must know how to harness. Students will become proficient in applying commonly used electronic audit tools to conduct computer-assisted audit techniques (CAATs).
Prerequisite(s): ACC 505 or ISM 525 or CIS 564
Restriction(s):
Can enroll if Class is Graduate

ACC 602  Contemporary Accounting Issues  3 Credit Hours
This course provides in-depth exposure to emerging contemporary issues in accounting. Topics in the seminar change to reflect the most relevant professional issues. The issues chosen are designed to be not only timely but to also provide insight into emerging future areas of the profession. In addition to lecture material and readings, the lecturer may incorporate case material, research papers, and other teaching methods as appropriate.
Prerequisite(s): ACC 600 and ACC 601
**ACC 603  Controllership  3 Credit Hours**
The nature of the control function in business corporations is the focus of this course. Thus, classes cover the characteristics of management planning and control in functional and divisional organizations, responsibility accounting and the role of efficiency and effectiveness in performance measurement. Coverage also extends to controllers' roles in strategic planning, programming, and budgeting, transfer pricing, and their behavioral, global, ethical, and technological dimensions. Class presentations employ case analysis and emphasize the qualitative nature of controllership.

**Prerequisite(s):** ACC 355 or ACC 555

**Restriction(s):**
Can enroll if Class is Graduate

**ACC 604  Auditing & Forensic Examination  3 Credit Hours**
To study forensic examination and investigation techniques including typical embezzlement and financial statement fraud scenarios, fraud risk factors, sources and uses of evidence, and interrogation and surveillance techniques. Other course topics may include auditing standards for private and public companies, expanding assurance services, advanced internal control testing, audit objectives and procedures, ethical standards, sampling techniques, auditor's report, risk based auditing, and management letters. Special attention will be given to the changing role and services offered by internal and external auditors, auditor responsibility to the public, and the ability of the auditor to offer assurance.

**Prerequisite(s):** ACC 457 or ACC 557

**ACC 605  International Accounting  3 Credit Hours**
To study selected topics in international accounting and taxation. The course will examine accounting principles and practices of the major world economies and consider issues typically encountered by U.S. corporations in accounting for and reporting the financial activities of foreign operations. Students will explore taxation of international operations and tax planning for the U.S. based multinational corporation.

**Prerequisite(s):** ACC 608 or ACC 356 or ACC 357 or ACC 358

**ACC 608  Financial Statement Analysis  3 Credit Hours**
The objective of financial statement analysis is to examine the relationship between financial statement information and the measurement of firm value. The analysis merges actual firm value created by economic process and estimating firm value through accounting reporting methods. Students will develop tools to interpret financial statement information for use by investors, creditors, and other third party stakeholders. Topics include, but are not limited to, an overview of financial statements, basic financial analysis, profitability analysis and the quality of earnings, cash flow analysis, asset analysis, liability analysis, and valuation and equity analysis.

**Prerequisite(s):** ACC 505 and (FIN 531* or FIN 401*)

**Restriction(s):**
Can enroll if Class is Graduate

**ACC 614  Advanced Accounting II  3 Credit Hours**
This course is intended to help students gain expertise in preparing financial statements for complex business organizations. Specific topics include: The preparation of segmental and consolidated financial statements. Intricate accounting issues associated with business combinations including but not limited to combinations at the date of acquisition and periods post acquisition. Analysis of inter-company transactions such as inventory and asset transfers between parent and subsidiary. Reporting for segments of a business as well as interim reporting. Reporting foreign exchange issues including inter-period reporting and financial statement translation. Analysis of firm issues related to SEC reporting, re-organization, bankruptcy and troubled debt restructuring. Understanding of issues associated with fair-value reporting. International reporting issues associated with all of the above, as well as other, topics. (OC)

**Prerequisite(s):** ACC 416 or ACC 516

**Restriction(s):**
Can enroll if Level is Rackham or Graduate

**ACC 616  Corp Acts & Reacts & Firm Val  3 Credit Hours**
This course will analyze various decisions made by the firm relating to its operations as well as environmental impacts on its operations. This analysis will focus on the interpretation or translation of these decisions and environmental impacts by the two main providers of estimates of the firm's economic value, its own financial statements and the stock market. The primary objective of this course is to illustrate how quickly, or slowly, firm decisions and environmental impacts are impounded into these estimates of firm value. Additionally, the need for both stock market participants and the accounting process to estimate the value of these events before all uncertainty concerning their actual economic impact of firm value can be known will be illustrated. Open only to MBA and dual MBA students.

**Prerequisite(s):** ACC 505 and FIN 531 and (DS 520 or IMSE 514)

**Restriction(s):**
Can enroll if Program is MBA-Business Administration, MBA/ISE-Management & ISE Dual, MBA/MHSA-Management & HSA Dual, MBA/MSF-Management & Fin Dual, MBA/MSIS-Mgmt & Info Sys Dual, MBA-Business Admin (Web)

**ACC 657  Adv Auditing & Assurance Serv  3 Credit Hours**
Full Title: Advanced Auditing and Assurance Services Introduces students to advanced audit and assurance service practices, strategies, and techniques. Topics include audit strategy, fraud, internal and operation audits, auditor liability, issues in audit information technologies, and audit practice. (OC)

**Prerequisite(s):** ACC 457 or ACC 557

**Restriction(s):**
Can enroll if Level is Rackham or Graduate

**ACC 660  Advanced Federal Income Tax  3 Credit Hours**
Full Title: Advanced Federal Income Taxation Survey analysis of federal tax law relating to the formation, operation, and liquidation of corporations, partnerships, and LLCs, including current distributions; and the election, operation, and termination of Subchapter S corporations. (OC)

**Prerequisite(s):** ACC 560 or ACC 360

**Restriction(s):**
Can enroll if Level is Rackham or Graduate

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### African & African-Amer Studies (AAAS)

**AAAS 503  Minority Groups  3 Credit Hours**
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. Additional reading assignments or projects will distinguish this course from its graduate version AAAS 403. Students cannot receive credit for both AAAS 403 and AAAS 503. (AY)
**Prerequisite(s):** SOC 200 or SOC 201
**Restriction(s):**
Can enroll if Class is Graduate

**AAAS 504  Dissed: Differ, Power, Discrim  3 Credit Hours**
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic, and political - in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a 'natural order', obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors, and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both AAAS 404 and AAAS 504. This course is distinguished from its 400-level counterpart by the requirement of additional assignments, including a required additional paper.
**Restriction(s):**
Can enroll if Class is Graduate

**AAAS 533  Race/Ethnic Health  3 Credit Hours**
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequality-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy interventions. (OC)

**AAAS 5401  Seminar: African Diaspora  3 Credit Hours**
Research seminar on the history of the African Diaspora in the Atlantic World. This course covers examples of classic texts in the field, as well as significant new scholarship, with an emphasis on critical reading, analysis, and the development of an independent research project. Students gain a deeper understanding of the significance of the African Diaspora in the New World, derived from lectures and discussions providing an overview of this subject, as well as the micro views gleaned from sharing classroom presentation about students’ individual research topics. The graduate version of this course includes weightier readings and assignments, with a research paper for potential publication.
**Restriction(s):**
Cannot enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Rackham or Graduate

**AAAS 569  Contemp African American Lit  3 Credit Hours**
An intensive study of major 20th century African American writers. Fiction, poetry, autobiography, and drama will be examined, but one genre will be stressed in any given term, e.g., the novel. Lectures will provide historical and biographical context for analysis and discussion on the works. (OC)
**Prerequisite(s):** (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
**Restriction(s):**
Can enroll if Class is Graduate

**AAAS 577  African American English  3 Credit Hours**
An examination of the structure, history and use of African-American English. Topics will include the pronunciation, grammar and vocabulary of African-American English, theories of origin, linguistic repertoire and code-switching in African-American communities, the Ebonics controversy, and the role of this variety in education and identity formation. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both AAAS 477 and AAAS 577.
**Prerequisite(s):** LING 280 or LING 281 or LING 480 or LING 580
**Restriction(s):**
Can enroll if Class is Graduate

**AAAS 591  Topics in African Diaspora  3 Credit Hours**
This course deals with African Diasporan history from the 19th century to the present. The method is by definition cross-cultural and comparative, requiring that the works or figures under study represent a diversity of Diasporan nationalities and/or cultures. The course may focus on a wide range of topics. Students cannot receive credit for AAAS 491 and 591 when the topic title is the same.
**Restriction(s):**
Can enroll if Class is Graduate

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**Frequency of Offering**

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### Anthropology (ANTH)

**ANTH 506  Culture and Sexuality  3 Credit Hours**
The study of women, men, children, socialization practices, and the genesis of sex roles cross-culturally. Additionally, reading assignments or projects will distinguish this course from its undergraduate version ANTH 406. Students cannot receive credit for both ANTH 406 and ANTH 506. ANTH 101 recommended. (YR).
**Prerequisite(s):** ANTH 101
**Restriction(s):**
Can enroll if Class is Graduate
ANTH 509 Human Body, Growth and Health 3 Credit Hours
This course provides an advanced undergraduate introduction to the topic of human growth and shows how human growth can be a reliable measure of the psychological, social, economic and moral conditions of a society. A major theme will be the interplay of biology and culture in shaping the patterns of human growth and, consequently, the health of populations and individuals.

Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Graduate

ANTH 515 Nutrition and Health 3 Credit Hours
The influence of nutrition on physical and mental development from conception to adulthood. Topics include: 1) definition and function of the essential nutrients for people, 2) basic principles of human growth and development, 3) the causes and consequences of under- and over-nutrition, 4) feeding practices for infants and children and the development of food habits, 5) nutrient and food problems in the local region and in global perspective. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 415. Students cannot receive credit for both ANTH 415 and ANTH 515. (YR).

Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Graduate

ANTH 520 Kinship and Marriage 3 Credit Hours
A study of the diversity of kinship and marriage systems, and of the history of kinship theory which has played a seminal role in the development of general anthropological theory. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 420. Students cannot receive credit for both ANTH 420 and ANTH 520. (OC).

Prerequisite(s): ANTH 101 or ANTH 201
Restriction(s):
Can enroll if Level is Rackham or Graduate

ANTH 521 Education and Culture 3 Credit Hours
How and where do people learn? Why are there schools, and how is schooling culturally organized? Why do school experiences tend to vary by "race", social class, and gender? What insights does anthropology bring to practical problems of learning and teaching? Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 421. Students cannot receive credit for both ANTH 421 and ANTH 521. (AY).

Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Level is Rackham or Graduate

ANTH 525 Language and Society 3 Credit Hours
An examination of the social functions of speech through readings and exercises, emphasizing schools and other applied settings. Topics include ethnic and social class dialects, codeswitching, and the organization of conversation. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 425. Students cannot receive credit for both ANTH 425 and ANTH 525. (OC).

Prerequisite(s): ANTH 101 or LING 280
Restriction(s):
Can enroll if Level is Rackham or Graduate

ANTH 530 Health, Culture and Medicine 3 Credit Hours
A comprehensive examination of how culture mediates processes of illness and healing. Comparative materials worldwide are examined and provide a context for an anthropological analysis of modern biomedicine. Special attention is given to psychosocial illnesses, culture-bound syndromes, and the role of meaning in sickness and curing. Admission to the Master of Science in Health Psychology Program or permission of instructor. (W).

Prerequisite(s):
Can enroll if Class is Graduate

ANTH 555 Immigrant Cultures and Gender 3 Credit Hours
The history and culture of immigration since 1850, including: 1) formation and perseverance of immigrant communities and interethnic boundaries; 2) relations between the homeland and the immigrant; and 3) impact of migration on family life and gender roles. Additional reading assignments or project will distinguish this course from its undergraduate version ANTH 455. Students cannot receive credit for both ANTH 455 and ANTH 555. ANTH 101 recommended. (OC).

Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Graduate

ANTH 560 Economic Anthropology 3 Credit Hours
A comparative examination of the basis of political economy. Economic problems (the production and distribution of goods and services) will be considered in ecological, evolutionary, and political terms. The primary emphasis will be on traditional economies, on production and exchange at the household level, and on the effect of modern market systems on indigenous cultures. (OC).

Restriction(s):
Can enroll if Class is Graduate

ANTH 570 Doing Anthropology 3 Credit Hours
A practicum of anthropological theory and method, including ethnographic interviews and participant observation. Students will conduct field research and evaluate results with the help of classmates. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 470. Students cannot receive credit for both ANTH 470 and ANTH 570. (YR).

Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Level is Rackham or Graduate

ANTH 577 Ethnographic Film 3 Credit Hours
This course will analyze ethnographic films as a medium for the construction of meaning in and across cultures. It will teach students to understand how the putatively "real" content of documentary film creates a mixture of fantasy, news and "science." Covering texts as varied as National Geographic photographic layouts, traditional ethnographic films made by anthropologists, and auto-ethnographies of cultural groups such as Native Americans and the Trobriand Islanders of Papua New Guinea, the course will aim to deconstruct such oppositions as indigene vs. alien, us vs. them, and self vs. other. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 477. Students cannot receive credit for both ANTH 477 and ANTH 577. (AY).

Prerequisite(s): FILM 248 or HUM 248 or ANTH 101 or ENGL 248 or JASS 248
Restriction(s):
Can enroll if Class is Graduate
ANTH 581  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create. Students cannot receive credit for both ANTH 481 and ANTH 581. (AY).
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Arts, Sciences, and Letters

ANTH 582  Psychological Anthropology  3 Credit Hours
Cross-cultural comparison of theories of human nature, including psychoanalytic anthropology, culture-and-personality, and other theories from Western science, as well as non-Western theories about such concepts as the person, emotions, and mental illness. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 482. Students cannot receive credit for both ANTH 482 and ANTH 582. ANTH 101 and PSYC 170 or 171 highly recommended. (YR).
Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Graduate

ANTH 590  Topics in Anthropology  1 to 3 Credit Hours
Examination of problems and issues in selected areas of anthropology. Title in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs. (OC).

ANTH 598  Independent Study  1 to 6 Credit Hours
Readings or analytical assignments in Anthropology in accordance with the needs and interests of those enrolled and agreed upon by the student and instructor. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ANTH 599  Readings in Anthropology  1 to 3 Credit Hours
For students desiring study not available in the regular course offerings. Additional reading assignments or projects will distinguish this course from its undergraduate version ANTH 499. Students cannot receive credit for both ANTH 499 and ANTH 599. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

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Frequency of Offering

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Arab American Studies (AAST)

AAST 5676  Arab Americans Since 1890  3 Credit Hours
This course traces immigration from Syria, Lebanon and Palestine (Bilad al Sham) to the U.S. from the 1890's to the present. We begin by utilizing theories on immigration and ethnicity in order to understand patterns of settlement, work, and leisure, and examine the Arab Americans' religious life, press, and evaluate their membership in unions and political parties. Participants will gain knowledge of the immigrants' past achievements and more recent scholarship on their development in public and private spheres. The course includes activities in local institutions, researching archival material, and contact with community leaders. This course will provide knowledge of the historical roots of the Arab Americans' adjustment to life as U.S. citizens and will prepare the students for further inquiry. Graduate Students can expect to evaluate archival manuscript collections, lead class discussions and could engage original research.
Restriction(s):
Can enroll if Class is Graduate

AAST 5677  Arab American Identity  3 Credit Hours
Extensive discussions and critical analysis of the main markers of Arab American identity formation from late nineteenth century to present. This seminar provides in-depth assessments of immigrant narratives from various sources and disciplinary approaches on specific racial, ethnic, and gender experiences within the larger U.S. context. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Graduate

AAST 5678  Middle Eastern Diasporas  3 Credit Hours
This course explores the diasporas of Arabs, Turks, Assyrians, and Iranians living in Europe and the Americas that have occurred since the 1880s. It pays careful attention to how "aspects of diaspora" shape, mimic, transect, and undermine the political and economic regimes of which they are part. The reception of Middle Eastern communities in different national contexts and historical periods receive special attention as do their adaptive strategies as religious, ethnic, gendered, and racialized minorities. Those enrolled in the graduate level of the course pursue additional readings and assignments.
Restriction(s):
Can enroll if Class is Graduate

AAST 573  Arab American Women Writers  3 Credit Hours
Examines the literary and cultural contributions of Arab and Arab American women novelists, poets, and artists to the development and consolidation of the cultures of understanding and coexistence; explores the tensions between citizenship and belonging, race and the politics of fear, gender and geographical mobility, and ethnic minorities and mainstream consciousness; discerns how Arab women writers and artists retell their various artistic endeavors to channel socio-political disenchantment, critique and civil disobedience; stresses how literary and artistic productions of heterogeneous number of Arab American women writers and artists can indeed foster alternative visions of socio-cultural coexistence, dialogue, and hospitality via artistic commitments to technical and stylistic experimentation and renovation.

AAST 590  Topics in Arab Amer Studies  3 Credit Hours
The content of this course will vary. All courses which will run under this number will cover Arab American issues. (OC)
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Art History (ARTH)

ARTH 516  Earl Mod Jpn Paint&Wood Prnts  3 Credit Hours
Paintings and woodblock prints of the Edo/Tokugawa (1600-1868) and Meiji (1868-1912) periods are considered in light of competing developments that on the one hand looked to Japan's classical tradition and on the other to the influence of arts and artists from China and the West. Special attention is given to female artists and images of women. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 106 or ARTH 241
Restriction(s):
Can enroll if Class is Graduate

ARTH 528  Roman Art and Memory  3 Credit Hours
In this course, we examine Roman art closely associated with personal commemoration and cultural memory, including portraiture, funerary monuments, imperial monuments, and public architecture. We explore these objects' relationship to Roman literary culture's theories of mnemotechnics, and in the social context of the Roman obsession with memory perpetuation. We also examine how art historians apply modern theories of collective and social memory in their scholarship on Roman art, creating new ways of understanding Roman sculpture, painting, and architecture. Finally, we investigate Roman spectacle and performance as a vehicle of cultural memory. Graduate students enrolled in this seminar will be exposed in greater depth to the theoretical and historiographical scholarship of cultural and collective memory, as well as to current topics in Roman art. Graduate students are responsible for additional reading assignments and more lengthy and substantial oral presentations and final papers, as outlined below. Students cannot earn credit for both ARTH 428 and ARTH/LIBS 528.
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106
Restriction(s):
Can enroll if Class is Graduate

ARTH 554  Rembrandt  3 Credit Hours
Rembrandt's paintings, drawings, and prints are considered in the full historical and cultural context of the Golden Age of the Northern Netherlands, a period of unprecedented wealth and cultural diversity. Special attention will be given to issues of style, iconography, biography, art criticism, gender, and artistic technique. (AY).
Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103
Restriction(s):
Can enroll if Class is Graduate

ARTH 569  Collage, Montage, Assemblage  3 Credit Hours
Different conceptions of collage, montage, and assemblage have vitally shaped artistic practice in the twentieth century, perhaps even more so than the advent of modernism abstraction. The modern phenomenon of collecting, mixing, and sampling that permeates the last century up to and including the contemporary moment will be traced in the class across the thresholds of painting, sculpture, architecture, photography, and film. We will discuss a wide range of movements, genres, and styles (Cubism, Futurism, Surrealism, Dada, Weimar and Russian photomontage, Soviet film, found footage film, French decollage, postwar assemblage) and their relation to the ever-changing mass media, the urban, and the modernized in short, the everyday. The last segment of the class addressed more recent interpretations of the collage paradigm, including installation art and digital applications. Student cannot receive credit for both ARTH 469 and ARTH 569.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

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Automotive Engineering (AENG)

AENG 500  Automobile: An Integrated Syst  3 Credit Hours
Factors external to engineering such as markets, financing, and sales; the customers and their perceptions as influenced by marketing and performance; volume markets; international. An abc of engineering factors in all the components and sub-systems areas and in the plant, labor, and supplies area. Vehicle characteristics and dynamic interactions.
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Automotive Systems Engineering

AENG 502  Modeling of Automotive Systems  3 Credit Hours
This course will first introduce systems modeling approach and then develop mathematical models for ride, vibration, handling control, etc. of automobiles. The models will then be used to examine the design and performance of an automobile from a systems point of view. (F, YR).
Prerequisite(s): ME 265 or ME 345

AENG 505  Intro to Embedded Systems  3 Credit Hours
Introduction to modern digital computer logic. Numbers and coding systems; Boolean algebra with applications to logic systems; combinational and sequential logic design; examples of digital logic circuits; simple machine language programming; microprocessors-programming, input/output, interrupts, and system design. (Not open to students with EE degree.)
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

AENG 510  Vehicle Electronics I  3 Credit Hours
Semiconductor diodes, junction transistors, FETS, rectifiers and power supplies, small signal amplifiers, biasing considerations, gain-bandwidth limitations, circuits models, automotive applications and case studies. (Not open to students with EE degree.)
Prerequisite(s): ECE 305
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

AENG 545  Vehicle Ergonomics I  3 Credit Hours
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science

AENG 546  Vehicle Ergonomics II  3 Credit Hours
This course covers advanced human factors engineering and ergonomics topics related to incorporation and integration of new display, information, lighting and sensor technologies to improve driver convenience, performance, safety, and to reduce driver distractions. The students will learn new evaluation methodologies, driver performance models, and use research equipment to measure driver performance, and evaluate usability issues. Some advanced topics to be covered include: driver workload, evaluation and design of new in-vehicle devices, advanced vehicle lighting, and driver vision systems, models to predict and evaluate field of view, target detection, disability and discomfort glare, legibility, etc. Three lecture hours including laboratory projects and demonstrations. Prerequisite: Graduate standing. (W).
Prerequisite(s): AENG 545

AENG 547  Automotive Powertrains I  3 Credit Hours
Topics in kinematics and dynamics including engine output and balance; mechanisms and machine theory. Force analysis and design of gears and shaft systems. Analysis of planetary gear trains. Design and analysis of automotive gear boxes.
Prerequisite(s): ME 265
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science

AENG 550  Design of Automotive Chassis  3 Credit Hours
This course provides a systems approach to the design of automotive chassis and body components and examines the influence of their design on the overall structural performance of the automobile. Design issues related to structural rigidity, ride comfort, safety and crash-worthiness, durability and assembly are covered. Applications of advanced materials and joining techniques are discussed. Analytical tools used in automotive structural design are also discussed.
Restriction(s):
Can enroll if Class is Graduate

AENG 551  FEM in Auto Structure Design  3 Credit Hours
This course is designed to introduce the applications of finite element method in automotive structure design. It includes specific design examples of vehicle NVH and durability with commercial pre-processor and FEA solver. The course also provides theoretical knowledge of FEA and vehicle design.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Automotive Systems Engineering

AENG 555  Vehicle Stability & Control  3 Credit Hours
Introduction to static and dynamic stability characteristics of vehicles. Study on directional vehicle responses and stability in small disturbance maneuver. Design, numerical simulation, and analysis of vehicle control systems (ABS, active suspension, and yaw stability). Prerequisite: Dynamics (ME 345), Control Systems Design and Analysis (ME 442) or equivalent.
Restriction(s):
Cannot enroll if Class is
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Automotive Systems Engineering
AENG 566  Vehicle Thermal Management  3 Credit Hours
This course covers fundamental thermo-fluid principles and advanced topics in thermal management of conventional and electric drive vehicles (EDVs). The topics include: principles of energy conservation, heat transfer, and fluid mechanics; vehicle thermal management system and components; electrification of vehicle thermal management system; EDV thermal management; battery thermal management in EDVs; and waste energy recovery.

Restriction(s):
- Can enroll if Level is Doctorate or Rackham or Graduate
- Can enroll if Major is Automotive Systems Engineering

AENG 576  Battery Sys Modeling & Ctrl  3 Credit Hours
Full Course Title: Battery Systems, Modeling, and Control This course will cover modeling, control, and estimation techniques for battery systems. Students will learn how electrochemical systems work and how they can be mathematically described. A simple phenomenological electrical circuit model and a detailed physics-based model that can capture diffusion dynamics will be covered. The thermal behavior of a battery system and its modeling will be covered as well. Students will learn the basic functions of battery management systems for monitoring state-of-charge, state-of-power, and state-of-health in applications to automotive and consumer electronics. (OC)

Restriction(s):
- Can enroll if Level is Doctorate or Rackham or Graduate
- Can enroll if Major is Automotive Systems Engineering

AENG 581  Materials Sel in Auto Design  3 Credit Hours
This course develops an understanding of the properties of modern engineering materials and explains the role of the materials selection process in product design, development, and manufacturing. Materials selection/design problems and case studies involving automotive and other commercial products are discussed. The role of environmental regulations, societal pressures and customer wants on the selection of alternate materials is discussed. (YR)

Restriction(s):
- Cannot enroll if Class is Rackham or Graduate or Doctorate
- Cannot enroll if Major is Automotive Systems Engineering

AENG 584  Lightweight Automotive Alloys  3 Credit Hours
This course introduces structure-processing-property relationships in the lightweight automotive alloys that are candidates for automotive applications such as aluminum, titanium, and magnesium. Metal matrix composite and intermetallic materials are also discussed. Emphasis will be placed on the processing and design of these materials in future automotive applications. (YR).

Restriction(s):
- Can enroll if Class is Graduate

AENG 586  Design & Mfg: Ltwt Auto Mat  3 Credit Hours
This course will address the design issues and manufacturing considerations for various lightweight automotive structural materials. Design issues will include stiffness, fatigue, vibrations, dent resistance, crush resistance, etc. Methods of producing lightweight automotive structures are discussed. Design for manufacturing, assembly, disassembly and recycling are emphasized. (YR).

Prerequisite(s): AENG 581 and AENG 587

AENG 587  Automotive Manuf Processes  3 Credit Hours
Manufacturing processes, including casting, forging, forming, machining, molding, etc., are examined specifically in the context of their applications in the automotive industry. Quality control and techniques, process selection and methods are emphasized.

Restriction(s):
- Can enroll if Level is Rackham or Graduate or or Doctorate
- Can enroll if College is Engineering and Computer Science
- Can enroll if Major is Automotive Systems Engineering

AENG 588  Design & Manuf for Environment  3 Credit Hours
This course is a focused on the effects of product design and manufacturing on the environment, with special emphasis on automobiles. The fundamental principles of life cycle engineering will be introduced. The importance of environmental improvement will be considered. Design and material selection for recycling, reuse and disposal will be illustrated. Furthermore, it will cover the elementary relationships between design and manufacturing for the development of future environmentally friendly vehicles.

Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if College is Engineering and Computer Science
- Can enroll if Program is MSE-Automotive Engineering

AENG 589  Auto Assembly Systems  3 Credit Hours
This course deals with the in-depth analysis of automotive assembly systems. Design, analysis and economics of manual and automatic assembly of automotive components are to be emphasized. It includes design of assembly stations for manual assembly; automatic assembly stations; design for assembly and disassembly; analysis of automatic feeding and orientation techniques of small parts; assembly of large parts; application of robotics in assembly; and economics of assembly for automotive systems as well as electronic systems.

Restriction(s):
- Cannot enroll if Class is Rackham or Graduate or Doctorate
- Cannot enroll if Major is Automotive Systems Engineering

AENG 590  Selected Topics  1 to 3 Credit Hours
Individual or group study of an automotive systems engineering topic of contemporary interest.

Restriction(s):
- Can enroll if Level is Graduate

AENG 591  Guided Study in Automotive Sys  1 to 3 Credit Hours
Individual or group study of an automotive systems engineering topic of contemporary interest.

Restriction(s):
- Can enroll if Class is Graduate

AENG 596  Internal Combustion Engines I  3 Credit Hours
Comparison of several forms of internal combustion engines including Otto and diesel-type piston engines; performance parameters and testing; thermodynamic cycles and fuel-air cycles; combustion in SI and Diesel engines; charge formation and handling; ignition; elements of exhaust emissions. (Not available to students with ME 496 or equivalent background.)

Prerequisite(s): ME 330

Restriction(s):
- Can enroll if Level is Rackham or Graduate or or Doctorate
- Can enroll if College is Engineering and Computer Science
- Can enroll if Major is Automotive Systems Engineering
AENG 598  Energy Sys for Auto Vehicles  3 Credit Hours
This course will discuss the current and future energy systems for automotive vehicles. Topics include liquid and gaseous fuels, direct energy conversion systems and fuel cells. Characteristics of various energy systems are discussed with respect to their performance, cost, reliability and environmental concerns. Fuel cell analysis and design is covered in detail. (W, AY).
Prerequisite(s): ME 496 or AENG 596
Restriction(s):
Can enroll if Class is Graduate

AENG 650  Anlys&Des for Veh Crshwrthnss  3 Credit Hours
This course aims to provide knowledge on vehicle crash mechanics, structural design to improve crashworthiness and crash energy management. Finite element techniques for vehicle crash analysis are also covered.
Prerequisite(s): ME 510 or AENG 551
Restriction(s):
Cannot enroll if Class is
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

AENG 687  Adv Auto Mfg Processes  3 Credit Hours
This course deals with in-depth analysis of select manufacturing processes used for the fabrication and assembly of automotive vehicles. Modeling and simulation of selected classes of manufacturing processes using numerical methods; such as finite difference and finite element methods, will be studied. Process optimization approaches will be introduced and applied to selected processes.
Prerequisite(s): AENG 587
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

AENG 698  Capstone Proj(Case Stud/Dsn)  3 to 6 Credit Hours
Individual or team design or case study of interest to the students. Topics may be chosen from any of the areas of automotive engineering. The student (or the team) will submit a project report and give an oral presentation at the end of the second term. The project spans two terms. (Permission of advisor required before registration.)
Prerequisite(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

AENG 699  Master's Thesis  3 to 6 Credit Hours
Research for master’s thesis under the direction of a faculty member. (Permission of advisor required.)
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

ASE 990  Doctoral Dissertation  1 to 9 Credit Hours
Dissertation work by a Ph.D. student who has been admitted to the candidacy status. The student must be registered during the semester of the dissertation defense. (1 to 9 credit hours per semester)
Restriction(s):
Can enroll if Class is Doctorate
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

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Frequency of Offering
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Automotive Systems Engineering (ASE)

ASE 798  Doctoral Seminar  0 Credit Hours
After attaining candidacy every Ph.D. student is required to attend and actively participate in seminars each semester until graduation. In addition, each Ph.D. student is required to present a one hour seminar about his/her research or an a pre assigned research topic, and lead a follow-up discussion on the future trends in his/her field.
Corequisite(s): ASE 990
Restriction(s):
Can enroll if Class is Doctorate
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

Bioengineering (BENG)

BENG 520  Adv Molecular and Cell Biology  3 Credit Hours
This course introduces the cell and molecular biology concepts from an engineering perspective and provides the foundation for modern biotechnology and bioengineering. This course is designed for a first year engineering graduate student to develop a comprehensive understanding of relevant applications in biology, including biochemical, cellular organizational, metabolic and genetics aspects. Advanced concepts including genomics, molecular biology, recombinant DNA technology and evolution are discussed. The course provides exposure to several key techniques used in biological engineering laboratories. Students will have chance to present and discuss individual application through team project. (YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is , Bioengineering
BENG 521  Biomaterials and Biochem Interface  3 Credit Hours
The course will provide graduate-level foundation on biomaterials
science and principles. Specifically, the course will involve discussion
on the importance of surfaces and interfaces in biomaterial function
and elements controlling host responses to materials, introduction to
biomimetic and rational designing approaches, and develop critical
analyses of biomaterials through reading research papers and developing
projects. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 526  Fundamentals of Drug Delivery  3 Credit Hours
This course is designed to provide students with an understanding on
the concepts in drug delivery from an engineering perspective. The course
will cover drug delivery mechanisms, quantitative understanding of drug
transport, nanotechnology, drug delivery devices, toxicity and immune
response, FDA regulations, clinical trials and technology transfer. The
course will conclude with a design project on nanoparticles development
for targeted drug delivery. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 550  Biomed Optics and Biophotonics  3 Credit Hours
The recent explosion of interest in minimally invasive medical diagnostics
has been fueled in part by the development of novel optics and
photonics techniques and instrumentation designed specifically for
medical applications. A large number of optically-based imaging and
sensing diagnostics are now in use in both the research laboratory and
medical clinic. Topics include engineering design principles of optical
instrumentation for medical diagnostics, elastic and inelastic light
scattering theory and biomedical applications, confocal and multiphoton
microscopy, light propagation and optical tomographic imaging in
biological tissues, and design of minimally invasive spectroscopic
diagnostics. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 551  Microfluidics  3 Credit Hours
Microscaled systems and devices have enhanced reaction rates,
predictable fluidic mechanics, reduced reagent volumes, and also lowered
cost of manufacturing. These advantages benefit many biomedical
applications that require sensitive molecular detection in robust and
 economical devices. In this course, a range of microsystem techniques
will be discussed, including those based on Microfluidics, BioMEMS, and
Optofluidics. The lectures will meet twice a week, one hour each, and will
be accompanied by student-driven design projects that will be conducted
in 3-hour laboratories. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 552  Nanobiosystems Engineering  3 Credit Hours
Nanobiosystems Engineering is an emerging frontier in nanotechnology.
It integrates materials science, bioengineering, physics and life science
with the biological and biochemical applications. This fast-developing
interdisciplinary field holds the promise to solve many of the medical
problems of future. The course will introduce advanced concepts
related to nanomaterials and nanofabrication and their application in
medicine. The course will also focus on design and development of
nano-devices for the applications of pharmaceuticals and healthcare.
Typical applications including nano-biosensor, targeted drug delivery, and
tissue engineering will also be discussed. Students in Bioengineering will
have chance to present and discuss individual application through team
project. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 555  Molec and Cell Biochemistry  3 Credit Hours
This course will discuss principles of tissue engineering whereby
the properties of stem as well as primary cells, growth factors, and
extracellular matrix and their impact in the development of engineered
tissue constructs will be explored. In addition, the course will also focus
on supporting/enabling technologies typically utilized in engineering
these constructs including nano- and micro-fabrication techniques, 3D
printing, micro-patterning as well designing principles of bioreactors,
and drug and gene delivery techniques. Additionally, various tissue
engineering applications will be discussed including synthetic tissues
and organs that are currently under development for regenerative
medicine application. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 570  Advanced Biomechanics  3 Credit Hours
This course applies the field of orthopedics to biomechanics, analysis
and design. Topics include: soft tissue biomechanics, human motion
analysis including gait, orthopedic implants, fixation and reconstruction,
head impact and injury, advanced bone models. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 571  Impact Biomechanics  3 Credit Hours
This course focuses on the understanding of the behavior of human
organs, bone and tissue at their point of mechanical or functional failure.
Topics will include research methods in injury biomechanics, injury
tolerance of the structures and materials of the head, brain, spine, thorax,
abdomen and extremities and injury prevention focusing on safety
equipment. Federal motor vehicle safety standards will be discussed.
(YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 575  Regenerative Engineering  3 Credit Hours
This course will discuss principles of tissue engineering whereby
the properties of stem as well as primary cells, growth factors, and
extracellular matrix and their impact in the development of engineered
tissue constructs will be explored. In addition, the course will also focus
on supporting/enabling technologies typically utilized in engineering
these constructs including nano- and micro-fabrication techniques, 3D
printing, micro-patterning as well designing principles of bioreactors,
and drug and gene delivery techniques. Additionally, various tissue
engineering applications will be discussed including synthetic tissues
and organs that are currently under development for regenerative
medicine application. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering

BENG 580  Biomolecular Systems Engineering  3 Credit Hours
This course will provide graduate-level foundation on biomaterials
science and principles. Specifically, the course will involve discussion
on the importance of surfaces and interfaces in biomaterial function
and elements controlling host responses to materials, introduction to
biomimetic and rational designing approaches, and develop critical
analyses of biomaterials through reading research papers and developing
projects. (YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering
**BENG 595**  Digital Manufacturing  3 Credit Hours  
This combined lecture and hands on project course aims to train students to optimize the interplay of materials, people, machines and profitability. The course introduces methods to identify product concepts with commercial potential. Student teams will perform market analysis and explore the intellectual property space around their ideas and rapidly iterate them into a final prototype via direct digital manufacturing (e.g., 3D CAD/CAM files manifested via digital printing or machining). Advanced instruction on direct digital manufacturing tools will be given, and customer response will be used as feedback. Early stage prototypes will progress into more sophisticated designs, scaling up (cost, pricing, tooling, process flow and automation) scenario planning for mass manufacturing as well as Failure Mode Effect Analysis (FMEA) will be discussed.  
(W, YR)  
**Restriction(s):**  
Cannot enroll if Level is  
Can enroll if Major is , Bioengineering  

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**BENG 600**  Study or Research in BENG  1 to 3 Credit Hours  
Individual study or research in an area of bioengineering under supervision of a faculty member. The student will submit a written report at the close of the term. (YR)  
**Restriction(s):**  
Can enroll if Level is Rackham or Graduate or or Doctorate  

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**BENG 699**  Master's Thesis  1 to 6 Credit Hours  
Research project in the area of bioengineering conducted under supervision of a program faculty member. While guided by a faculty member, a student electing this course is expected to carry out the work him-or herself. Successful completion of the course requires completion and public defense of a written thesis. A student must satisfactorily complete all 6 credit hours, which can be distributed over multiple semesters. (YR)  
**Restriction(s):**  
Can enroll if Level is Rackham or Graduate  

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(A) alternating years;  
(OC) offered occasionally  

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**Biological Science (BIOL)**  

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**BIOL 514**  Applied Ecology  3 Credit Hours  
An advanced treatment of the principles of ecology especially as they relate to environmental problems and environmental management. This course is intended for graduate students and for undergraduate fulfillment of the biology capstone requirement. Students should have earned a C or above in Ecology (BIOL/ESCI 304) or equivalent.  
**Prerequisite(s):** BIOL 304 or ESCI 304  
**Restriction(s):**  
Can enroll if Class is Graduate  
Cannot enroll if Level is Undergraduate or Professional Development  

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**BIOL 515**  Aquatic Ecosystems  4 Credit Hours  
Advanced course based on the comparative study of the structure and function of lakes, wetlands and rivers. The physical, geological, chemical and biological characteristics of natural and disturbed ecosystems will be emphasized. (F, AY)  
**Prerequisite(s):** BIOL 130 and CHEM 124 and GEOL 118  
**Restriction(s):**  
Can enroll if Class is Graduate  

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**BIOL 516**  Limnology  3 Credit Hours  
The study of the structural and functional relationships and productivity of organisms in lakes and streams as they are regulated by their physical, chemical and biotic environments. BIOL/ESCI 304 or ESCI 275 required. Not open to undergraduates or students who have taken BIOL/ESCI 414.  
**Prerequisite(s):** BIOL 304 or ESCI 301 or ESCI 304 or ESCI 275  
**Restriction(s):**  
Can enroll if Level is Rackham or Graduate  

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**BIOL 517**  Wetland Biology  3 Credit Hours  
An in depth examination of wetlands from functional, habitat and management perspectives. Topics include hydrology, soils, biogeochemical cycling, biological adaptations, major wetland types, regulation, restoration and creation. Two all-day Saturday field trips required.  
**Prerequisite(s):** BIOL 304 or ESCI 304  
**Restriction(s):**  
Can enroll if Class is Post-baccalaureate NCFD or Post-baccalaureate Cert only or Senior or Graduate  

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**BIOL 519**  Behavior and Evolution  3 Credit Hours  
An in depth examination of how evolutionary processes shape behavior, focusing on the influence of natural, sexual, and kin selection. Topics include behavioral genetics, natural selection, sexual selection, kin selection, optimality, game theory, evolutionary stable strategies, phylogenetics, and the comparative method. Additional assignments will distinguish this course from the undergraduate version.  
**Restriction(s):**  
Can enroll if Class is Graduate  

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**BIOL 522**  Conservation Biology  3 Credit Hours  
This course is a study of the historical and current preservation of global biodiversity. The value of biodiversity, extinction, threats to biodiversity, and both ex situ and in situ conservation strategies are considered. A student may not receive credit for both BIOL/ESCI 422 and BIOL 522. (W, AY)  
**Restriction(s):**  
Can enroll if Class is Graduate  

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**BIOL 501**  Discoveries in Current Biology  3 Credit Hours  
Current issues in biology based on an inquiry approach to learning with a primary emphasis on laboratory, field observations, and discussion. Students will help to develop the specific topics within the subject areas that include the environment, heredity, and health. Projects will have direct applications for classroom teaching. Lecture and laboratory. Permission of College of Education, Health, and Human Services advisor. Teacher experience. (S).  

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**BIOL 508**  Invasive Species Ecology  3 Credit Hours  
This course will examine the biological, ecological and societal impacts of invasive species. Major issues including characteristics of invasive species, invaded communities, origins and success rates of invaders, economic and health effects, methodologies and regulatory strategies for dealing with invasive species will be discussed. Students will investigate an invasive species and make oral and written reports.  
**Prerequisite(s):** BIOL 304 or BIOL 320
BIOL 524  Biology of Spiders  4 Credit Hours
An introduction to the biology of spiders and related arachnids. Lectures include spider anatomy, natural history, ecology, and evolution. Laboratory work includes specimen preparation, use of dichotomous keys, spider behavior, field methods, rearing and collecting techniques, and identification of spiders and their webs. Three hours lecture, four hours laboratory. Students cannot receive credit for both Biology 424 and Biology 524.
Prerequisite(s): BIOL 130
Restriction(s):
Can enroll if Class is Graduate

BIOL 545  Restoration Ecology  3 Credit Hours
Restoration Ecology is an interdisciplinary course that develops theories and practices that help rehabilitate impaired ecosystems towards a sustainable state. Bioremediation and phytoremediation are some approaches to be discussed. Short-term site management is discussed, often including continued resource or recreational use, with the eventual site sustainability in mind. (F, W)
Prerequisite(s): BIOL 140 and CHEM 225 or (BIOL 301 or BIOL 303 or BIOL 385 or BIOL 370 or BIOL 455 or BIOL 470)
Restriction(s):
Can enroll if Level is Rackham or Graduate

BIOL 552  Med & Env Toxicology  3 Credit Hours
Mechanistic concepts of toxicology at the cellular and molecular levels. The course is taught from a human health perspective focusing on contemporary problems and environmental associations. Three hours lecture.
Prerequisite(s): BIOL 140 and CHEM 225 or (BIOL 301 or BIOL 303 or BIOL 385 or BIOL 370 or BIOL 455 or BIOL 470)
Restriction(s):
Can enroll if Level is Rackham or Graduate

BIOL 556  Behavioral Biology  4 Credit Hours
This course uses evolutionary and ecological theory to evaluate behavioral adaptations of organisms to their environment. Topics discussed include game theory, kin selection, sexual selection, eusociality, orientation and navigation, and signal evolution. Laboratory sessions include: observations of animal behavior, required manipulations of live animals, and field trips. Three hours of lecture, one four-hour laboratory.
Restriction(s):
Cannot enroll if Class is Undergraduate NCFD or Freshman or Sophomore or Junior or Senior

BIOL 561  Advances in Cell Biology  2 Credit Hours
Normal and environmentally changing circumstances regulate genes and proteins affecting many important cellular processes. This course will link recent discoveries in cell biology to organisms and the environment that the cell inhabits. Lectures will discuss the roles of organelle and membrane structure and function, gene regulation, metabolism, immunology, and cellular pathology. (OC)
Prerequisite(s): BIOL 140 and CHEM 225 and (BIOL 301 or BIOL 303 or BIOL 304 or BIOL 306 or BIOL 307 or BIOL 309 or BIOL 310 or BIOL 311 or BIOL 312 or BIOL 313 or BIOL 315 or BIOL 320 or BIOL 326 or BIOL 333 or BIOL 335 or BIOL 350 or BIOL 351 or BIOL 360 or BIOL 361 or BIOL 370 or BIOL 380 or BIOL 385 or BIOL 390 or BIOL 405 or BIOL 406 or BIOL 414 or BIOL 416 or BIOL 420 or BIOL 450 or BIOL 455 or BIOL 459 or BIOL 470 or BIOL 471 or BIOL 472 or BIOL 473 or BIOL 474 or BIOL 485 or BIOL 489 or BIOL 490 or BIOL 495 or BIOL 497 or BIOL 498 or BIOL 499 or BIOL 501 or BIOL 514 or BIOL 515 or BIOL 545 or BIOL 552 or BIOL 590)
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if Level is Rackham or Graduate

BIOL 590  Topics in Biology  1 to 4 Credit Hours
Current topics in Biology. One to four credit hours. (OC)
Restriction(s):
Can enroll if Class is Graduate

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Business Administration (BA)

BA 605  Mgrl Dec Making  3 Credit Hours
This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.
Prerequisite(s): BE 530 and MIS 525 and OB 510 and (DS 520 or IMSE 510 or IMSE 514)

BA 611  Organizational Economics  3 Credit Hours
This course focuses on the transactions and contracts that occur within and between organizations. You will learn economic frameworks that can inform decisions about a firm's scope, internal hierarchies, and incentive structures. You will apply these frameworks to readings and cases about organizational failures (e.g., oil spills, rocket explosions, corruption cases), successes (e.g., initial iPhone commercialization), and contracting dilemmas (e.g., incomplete contracts, hold-up, asymmetric information, regulations and certifying organizations). Students interested in a wide variety of business professions will find the expertise gained in this course to be useful for decisions about structuring complex projects and company-wide initiatives, allocating scarce resources, and fostering organizational change. (YR)
Prerequisite(s): ACC 505 and BE 530 and OB 510
Restriction(s):
Can enroll if Degree is Master of Business Admin
Can enroll if College is Business
BA 690  Graduate Research  1 to 3 Credit Hours
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project’s completion.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Business

BA 691  Graduate Seminar  1 to 3 Credit Hours
Topics Course. To provide masters candidates with an opportunity for study of selected advanced topics in particular fields. Topics vary. See Schedule of Classes for current offerings. May be elected more than once if topics differ.
Prerequisite(s): (MIS 525 or MIS 502) and (MKT 515 or MKT 610)
Restriction(s):
Can enroll if Class is Graduate

BA 691A  Graduate Seminar  3 Credit Hours
Topic: The Internal Revenue Service. This course introduces the student to the structure, organization, practices and procedures of the Internal Revenue Service. The course is intended to give students an understanding of the organizational makeup of the Internal Revenue Service and the authority of its various employees. The different approaches to resolving tax controversies will be explored through the study of assigned readings and in-depth class discussions. The course will be conducted in a seminar-like fashion with each student expected to make significant contributions to class discussions. Attention is given to news items affecting the area of federal tax procedures is expected, as well as conveyance to class of these newsworthy developments. This course is appropriate for MSA? Tax Concentration students.

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Business Economics (BE)

BE 530  Econ Analysis: Firm & Consumer  3 Credit Hours
This is a microeconomics course with a managerial emphasis designed for graduate students. Microeconomics is a branch of economics that studies the behavior of individual consumers, producers, and industries. This course emphasizes business applications of economic theories. Among the topics covered are supply and demand, production functions, cost minimization, profit maximization, competitive markets, monopoly and oligopoly, monopolistic competition, oligopoly, decision making in uncertain situations, and asymmetric information. The mathematics admission prerequisite must be satisfied prior to electing BE 530.
Prerequisite(s): Mathematics Placement with a score of 105 or MATH 104 or MATH 105 or MATH 113 or MATH 115
Restriction(s):
Can enroll if Class is Graduate

BE 580  Econ Analysis: Nat’l & Intl  3 Credit Hours
This is a macroeconomics course designed for graduate management students. Macroeconomics is a branch of economics that studies the performance of entire economies. Accordingly, this course develops an understanding of both the domestic economic situation and the importance of global interactions. Topics include analysis of the levels of aggregate output, employment and prices, the roles of aggregate supply and aggregate demand, monetary and fiscal systems and policies; and the impacts of international trade and financial flows.
Prerequisite(s): BE 530
Restriction(s):
Can enroll if Class is Graduate

BE 583  Global Econ: Crisis & Growth  3 Credit Hours
This AIM course develops the understanding of the global economy and financial system necessary for business leaders. Understanding of the fundamentals of macroeconomic systems is developed in the first half of the course including both domestic and international perspectives. In the second half of the course these fundamentals are expanded and shown how they apply to contemporary global events. The financial instruments which played an important role in these global economic events are understood both in terms of their construction and their effects. By seeing how the tools apply to the modern international economic system, students will gain an ability of how to apply the tools of macroeconomics and finance to the international events of the future. No credit for both BE 580 and BE 583.
Prerequisite(s): BE 530 and (DS 520 or IMSE 510 or IMSE 514) and FIN 531
Restriction(s):
Can enroll if Class is Graduate

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Business Internship (BI)

BI 500  Business Internship  3 Credit Hours
The internship provides full-time paid experience for students in a professional business environment. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and evaluation documents at the end of each work assignment and participate in an assessment session with the internship staff. (A maximum of 3 credit hours of internship course work from BI 500, BI 505 or BI 560 may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Class is Graduate
BI 505 Part-Time Business Internship 1 Credit Hour
The internship provides part-time paid and unpaid experience for students in a professional business environment. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and evaluation documents at the end of each work assignment and participate in an assessment session with the internship staff. This course may be repeated a maximum of three times (A maximum of 3 credit hours of internship course work from BI 500, BI 505 or BI 560 may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Degree is Master of Science, Master of Science in Finance, Master of Business Admin

BI 560 International Business Intern 1 to 3 Credit Hours
This internship allows flexibility to engage in applied practical work experience outside of the United States, through paid or unpaid and full or part time work experiences. Participating organizations hire students within parameters set by the Internship Program. Students are required to maintain contact with the Internship Office throughout their experience. Students are required to submit reports, evaluation documents and participate in an assessment session with the internship staff. Students are responsible for their own legal, housing and transportation issues. This course will satisfy non-resident academic credit, which may be applied to elective credit for the student’s degree requirements. (A maximum of 3 credit hours of internship course work from BI 500, BI 505, or BI 560 may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Level is Graduate
Can enroll if College is Business

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Frequency of Offering
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Business Policy and Strategy (BPS)

BPS 516 Corporate Social Responsib 3 Credit Hours
The focus of this writing intensive interdisciplinary course will be on covering the perspectives that form the context for business: the pressure from changing ethical and global issues; the influence of political, social, legal and regulatory, environmental, and technological issues; and the impact of diversity on the organization. These issues will be addressed from the viewpoint of the various stakeholder groups that impact a business including shareholders, employees, customers, community (including the global community), and the natural environment.
Restriction(s):
Can enroll if Class is Graduate

BPS 535 Strategic Plan and Dec Making 3 Credit Hours
To study management of the business in relationship to its external environment. Emphasis is on strategic analysis, strategy formulation, and strategy implementation. Topics include: the strategic management process; developing a strategic vision; setting objectives; company, industry, and competitive analysis; strategic analysis and competitive advantage; crafting strategy at the functional, business, corporate, and international levels; designing the organizational structure; and designing operational policies and procedures, and reward systems.
Prerequisite(s): ACC 505 and FIN 531 and MKT 515 and OB 510 and (EMGT 520 or IMSE 580 or OM 521)
Restriction(s):
Can enroll if Class is Graduate

BPS 585 Managing Strat Innov & Change 3 Credit Hours
This course examines how even well-designed, highly capable organizations fail to deal with the challenges of technological and industry changes if they do not pursue strategies that fit the moving competitive landscape. Emphasis is placed on developing a systematic understanding of the challenges involved in weaving together organizational components to create an organization that is capable of enacting successful competitive strategies, for nurturing, sustaining and exploiting innovation. The course will offer in-depth coverage of changes that ought to be made in various functional areas, marketing, finance, human resources etc., by building up and building on consistent capabilities of the company, while adapting to and exploiting competitive openings that new technologies may provide.
Prerequisite(s): ACC 505 and OB 510 and MKT 515 and FIN 531
Restriction(s):
Can enroll if Class is Graduate

Chemistry (CHEM)

CHEM 535 Green Chemistry 3 Credit Hours
An examination of green chemistry principles and methods used to assess and improve chemical processes with respect to environmental impact. Topics include: concepts of green chemistry, waste prevention, catalysis, renewable resources, alternative energy resources, and green technologies. Additional assignments and/or projects will distinguish this course from its undergraduate version CHEM 435. Students cannot receive credit for both CHEM 435 and CHEM 535.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior or Senior

CHEM 548 Environmental Chemistry 3 Credit Hours
Advanced study of the concepts, principles, practices, and current problems in the chemistry of natural waters, the soils, and the atmosphere. Students in this graduate-level course will engage in mutually agreed-upon projects in addition to the class work assigned undergraduates. (W, AY).
Prerequisite(s): CHEM 344 and (CHEM 225 or CHEM 325)
Restriction(s):
Can enroll if Class is Graduate
COMM 520  Critical Media Studies  3 Credit Hours
Course presents various critical approaches to the study of the media. Perspectives include political economy, cultural studies, critical theory of the Frankfurt school and feminism. Through readings and first hand analysis of the media students will delve deeply into the institutional underpinnings, content, use and reception of media. There will be special emphasis on how broader economic, cultural and technological changes influence our experience of media in everyday life as creators, citizens, audiences and consumers.
Restriction(s):
Can enroll if Class is Graduate

COMM 530  International Communication  3 Credit Hours
Course examines the relationship between globalization and communication from various vantage points such as cultural imperialism, global media flows, and hybridity theory. Students use these theoretical approaches to understand how people in particular locations experience, adapt, resist and modify globally circulating aspects of media, popular culture, news and information. Through critical responses to readings, class exercises, individual and team projects, students also explore how global pressures and changes influence the way people understand and project their identities, buy and sell communication as a commodity, negotiate borders, and create social change.
Restriction(s):
Can enroll if Class is Graduate

COMM 550  Prin of Organizational Comm  3 Credit Hours
Course examines how communication networks function in organizations. Purpose: to provide an organizational context and conceptual framework for the practice of professional writing and speaking skills. Writing projects include a research report, a case study, and shorter papers (practical and analytical) on assigned topics. Areas of focus include persuasion, decision-making, conflict resolution, problem solving, and the role of communication in leadership, motivation, small group activity, organizational change, and job satisfaction. (AY)
Prerequisite(s): COMM 340 or COMM 440
Restriction(s):
Can enroll if Class is Graduate

COMM 555  Gender and Media Studies  3 Credit Hours
The course will focus on several feminist approaches used in understanding the media and attempting to create social change through the media. The role of media in the definition and reproduction of gender-based hierarchies and in the renegotiation of gender boundaries will both be explored. To this end, both mainstream and women's media will be examined. The course will take a multicultural and international perspective, incorporating concerns of class, race, ethnicity, and nation as these intersect with the study of gender and media. Mainstream and alternative media will be analyzed through readings, films, case studies, in-class collaborative exercises and longer term projects. News, entertainment, and advertising genres will be examined in a variety of media, such as the printed press, television, video, film, and the Internet.
Prerequisite(s): WGST 275 or WGST 303
Restriction(s):
Can enroll if Class is Graduate

COMM 564  Contemporary Rhetorical Theory  3 Credit Hours
An examination of contemporary rhetorical theories through study of representative practitioners in related developments in linguistics, philosophy, and psychology. (OC)
Prerequisite(s): COMM 201 or COMM 220 or COMM 290 or ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250
Restriction(s):
Can enroll if Class is Graduate

COMM 570  Adv Technical and Prof Comm  3 Credit Hours
Review and practice of advanced professional communication skills, especially audience analysis, assessment of organizational contexts and field-specific conventions, document design, varieties of formal and informal report writing, proposal writing, abstracting, editing, and documentation. Students will study specialized formats and communication issues specific to their professional needs, and will develop their abilities to present technical and complex information to a variety of audiences, both general and specialized, in a variety of professional contexts. Appropriate for graduate students in professional degree programs, such as engineering, management, public administration, and education. Undergraduates must have permission of instructor.

COMM 577  Professional Comm Ethics  3 Credit Hours
An examination of professional communication in the organizational context, focusing on important issues, problems, and concepts. This course is designed to help students become conscious of the role of values in a wide range of professional communication situations; to locate organizational behavior in an ethical framework based on considered definitions, standards, perspectives, and criteria for evaluation and analysis; to consider individuals as well as organizations as moral agents in a changing and complex universe; and to analyze topical cases on emergent issues in communication ethics. (YR)
Prerequisite(s): COMM 340 or COMM 440 or COMM 450
Restriction(s):
Can enroll if Class is Graduate
COMM 581 Gender and Globalization 3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implications of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create. Students cannot receive credit for both COMM 481 and COMM 581. (AY).

Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Arts, Sciences, and Letters

COMM 590 Topics in Communication 1 to 3 Credit Hours
Examination of problems and issues in selected areas of Communications. Titles listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs. Only offered for graduate credit. (OC)

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Comparative Literature (COML)

COML 533 Writing Women in Renaissance 3 Credit Hours
This course will be taught in English, and will focus on the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Ariosto. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe, and Marguerite de Navarre. At issue will be women's roles and women's images in city and court culture during the early modern period, and the interaction of their writings with the literary canons of Italy and France. (OC).

Restriction(s):
Can enroll if Class is Graduate

COML 555 This American Life 3 Credit Hours
The course "This American Life: Immigrant Literature and the American Dream" is a literary and cultural analysis of the literature of immigration. The readings are from works of fiction in a variety of genres, and are written by American and non-American prize-winning authors. Their common denominator is the pursuit of the American Dream and its many multifaceted aspects. The themes explored include: assimilation, acculturation, diversity, language, subculture, intertextuality, nostalgia, belonging, and double identity. This course will be distinguished from its undergraduate counterpart, COML 455, by the inclusion of additional readings and assignments.

Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.
Computer & Information Science (CIS)

CIS 505  Algorithm Analysis and Design  3 Credit Hours
This course investigates how to design efficient algorithms. Topics covered include: asymptotic analysis, average-case and worst-case analysis, recurrence analysis, amortized analysis, classical algorithms, computational complexity analysis, NP-completeness, and approximation algorithms. In addition, the course investigates approaches to algorithm design including: greedy algorithms, divide and conquer, dynamic programming, randomization, and branch and bound.  
Prerequisite(s): CIS 350  
Restriction(s): Can enroll if Class is Graduate  
Can enroll if College is Engineering and Computer Science

CIS 510  Computer Interfacing  3 Credit Hours
This course covers fundamentals of computer interfacing to the external world through the following: parallel and serial interfaces, timers, interrupts, Uart, and Duart. Programming aspects will be emphasized. Knowledge of an assembly language required. (YR).  
Prerequisite(s): CIS 310

CIS 511  Natural Language Processing  3 Credit Hours
This course proves an introduction to the theory and practice of natural language processing (NLP), as well as the approaches that allow understanding, generating, and analyzing natural language. The course will cover the three major areas in NLP: syntax, semantics, and pragmatics. The course will introduce both knowledge-based and statistical approaches to NLP. Illustrate the use of NLP techniques and tools in a variety of application areas, and provide insight into many open research problems. (YR)  
Prerequisite(s): CIS 350 or CIS 3501

CIS 515  Computer Graphics  3 Credit Hours
Basic geometrical concepts, graphics primitives, two-dimensional transformations, segmented files, windowing and clipping, camera models, and 3-D viewing transformations. (F).  
Prerequisite(s): (CIS 350 or IMSE 350 or CCM 350) and (MATH 217 or MATH 227) and (MATH 205 or MATH 215)  
Restriction(s): Can enroll if Class is Graduate  
Can enroll if College is Engineering and Computer Science

CIS 525  Web Technology  3 Credit Hours
This course deals with the study of the technologies used to design and implement multimedia web sites. Topics include web servers, HTML, CGI, scripting languages, Java applets, back-end database connectivity, web security, multimedia, XML, web services, .NET, semantic web. (YR).  
Prerequisite(s): CIS 553*  
Restriction(s): Can enroll if Class is Graduate  
Can enroll if College is Engineering and Computer Science

CIS 527  Computer Networks  3 Credit Hours
To study the technical and management aspects of computer networks and distributed systems. Topics include: communication hardware, communication protocols, network architectures, local area networks, distributed database systems. Case studies and research project will be assigned for additional insight.  
Prerequisite(s): CIS 450 or IMSE 450 or ECE 478  
Restriction(s): Can enroll if College is Engineering and Computer Science

CIS 534  Semantic Web  3 Credit Hours
The aim of this course is to investigate the fundamental concepts, techniques, and technologies for enabling the envisioned semantic Web. The topics to be covered include ontologies, domain modeling, logic, reasoning and inference techniques, semantic Web services, and ontology interoperation/mappings. We will review major semantic web research projects, as well as current technologies for enabling the semantic web.  
Prerequisite(s): CIS 556  
Restriction(s): Can enroll if Level is Rackham or Graduate or or Doctorate  
Can enroll if College is Engineering and Computer Science

CIS 535  Wireless Tech/Pervasive Cmptg  3 Credit Hours
This course covers contemporary technologies for programmable mobile and wireless intelligent hand-held devices. Students will get an overview of mobile operating system concepts/techniques and will learn how to develop software for mobile/smart devices, with particular emphasis on the constraints intrinsic to such devices. Topics in location-based services and pervasive computing will also be covered. Participation in a project is a requirement in this course. This class requires knowledge in computer programming.  
Restriction(s): Can enroll if Class is Graduate  
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 536  Information Retrieval  3 Credit Hours
This course covers techniques for locating relevant semi-structured or unstructured documents, residing in a large document repository, satisfying various information needs. Particular attention will be paid to repositories of text documents or web pages. Participation in a project is a requirement in this course.  
Prerequisite(s): CIS 505  
Restriction(s): Can enroll if Level is Rackham or Graduate or or Doctorate
CIS 537  Advanced Networking & Dist Syst  3 Credit Hours
This course focuses on the design, implementation, analysis, and evaluation of large-scale networking systems. Specific networking topics include congestion/flow control, traffic analysis, routing, internetworking, multicast, mobile and wireless networks, quality of service, and security. Fundamental distributed systems topics include domain name service, global routing protocols, content delivery networks, and peer-to-peer systems.
Prerequisite(s): CIS 427 or CIS 527
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 540  Foundation of Info. Sec.  3 Credit Hours
This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features. The purpose of the course is to provide the student with an overview of the field of information security and assurance. Students will be exposed to the spectrum of security activities, methods, methodologies, and procedures. Coverage will include inspection and protection of information assets, detection of and reaction to threats to information assets, and examination of pre- and post-incident procedures, technical and managerial responses, and an overview of the information security planning and staffing functions. (F,YR)
Restriction(s):
Can enroll if Level is Graduate

CIS 544  Computer and Network Security  3 Credit Hours
The course will provide a broad spectrum introduction of the fundamental principles of computer and network security. Topics will include security policies, models and mechanism for confidentiality, integrity and availability, access control, authorization, cryptography and applications, threats and vulnerabilities in computer networks, key management, firewalls and security services in computer networks.
Prerequisite(s): CIS 450 or IMSE 450 or ECE 478
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 545  Data Security and Privacy  3 Credit Hours
With the continuing proliferation of ways to collect and use information about people, there is a great concern whether such use of information about people affects privacy adversely. This course covers basics of data security and privacy techniques which can facilitate the use of data in a secure and privacy-sensitive way. Topics include security and privacy challenges due to big data collection and analytics, technologies and strategies for data security and privacy (access control mechanism, integrity policy, cryptography and encryption, notice and consent, anonymization or de-identification, deletion and non-retention). (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

CIS 546  Security & Privacy Wireless Ntwk  3 Credit Hours
This course focuses on security issues in wireless networks, such as cellular networks, wireless LANs, mobile ad-hoc networks, vehicular networks, sensor networks, and RFID. The course will first present an overview of wireless networks, then focus on attacks and discuss proposed solutions and their limitations.
Prerequisite(s): CIS 527 or CIS 544
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 548  Sec and Priv in Cloud Comp  3 Credit Hours
This course covers the major security and privacy topics in cloud computing. The goals of this course are to familiarize students with the major security and privacy issues and challenges associated with cloud computing, and to show them how to address them. Topics include outsourced storage security and privacy, outsourced computation security and privacy, secure virtualization and cloud platform security, trusted cloud computing technology, key management in the cloud, cloud forensics, cloud-related regulatory and compliance issues, and business and security risk models.
Prerequisite(s): (CIS 477 or CIS 544) and ECE 528
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 549  Software Security  3 Credit Hours
This course provides a broad-spectrum introduction to the fundamental principles of software security, as well as the approaches that allow understanding common software security practices, analyzing programs for vulnerabilities, and methods for developing secure software systems. The course will cover three major areas: software attacks and defenses, program analysis, and software verification. Various forms of software will be considered in this class including high level applications and system software. The course will also provide insight into many open research problems in this area. (F,YR)
Prerequisite(s): CIS 350 or CCM 350 or CIS 3501 or ECE 371 or IMSE 350
Restriction(s):
Can enroll if Level is Graduate

CIS 550  Obj-Oriet Prog and Its Applic  3 Credit Hours
This course covers advanced programming techniques using objects and classes, including programming windows, menus, toolbars, and drawing in windows. Further applications include distributed computing in which client and server communicate with each other by sending messages.
Prerequisite(s): CIS 350

CIS 551  Advanced Computer Graphics  3 Credit Hours
Prerequisite(s): CIS 515

CIS 552  Inf Vis & Multimedia Gaming  3 Credit Hours
This course introduces basic techniques for digital animation, computer and video games, and web multimedia. Topics include the process of creating animated video clips from start to finish, including story creation, storyboarding, modeling, animation, and post-production; several key techniques for video editing and motion generation, including keyframe, motion capture editing, collision detection, particle systems, physical simulation, and real-time rendering; techniques for web animation and multimedia; and internet gaming.
Prerequisite(s): CIS 515 or CIS 587
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 553  Software Engineering  3 Credit Hours
Program design methodologies; control flow and data flow in programs; program measurement. Software life cycle; large program design, development, testing, and maintenance. Software reliability and fault tolerance. Evolution dynamics of software. (YR).
Prerequisite(s): CIS 375
Restriction(s):
Can enroll if College is Engineering and Computer Science
CIS 554  Info Sys Analysis and Design  3 Credit Hours
To analyze the information needs of organizations and design suitable information systems to meet their needs. Topics include: systems analysis and design techniques related to analyzing and determining information needs, feasibility studies, designing input/processing/output systems, and hardware/software development and evaluation.
Prerequisite(s): CIS 350

CIS 555  Dec Support and Expert System  3 Credit Hours
To study the application of artificial intelligence in building decision support and expert systems for management and other applications. Topics include: fundamentals of artificial intelligence, knowledge representation and knowledge processing, tools for building expert systems and decision support system design. (YR).
Prerequisite(s): CIS 350 or IMSE 350 or CCM 350
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 556  Database Systems  3 Credit Hours
An examination of the database approach to data management in computer systems. Topics include database fundamentals, the relational, network, and hierarchical database models, normalization of data, distributed databases, and current trends and issues. (YR).
Prerequisite(s): CIS 350 or IMSE 350 or CCM 350
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 5570  Introduction to Big Data  3 Credit Hours
This course provides an overview of what big data is and explores its characteristics. It introduces the fundamental technologies, platforms, and methods that enable Big Data analysis, and covers how to acquire, store, and analyze very large amounts of information to complete Big Data analysis tasks. Students will gain hands-on experience in real-world applications of Big Data such as in cyber-physical systems and health informatics. Most of the work in this course will be team-based and task-oriented.
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

CIS 559  Prin of Social Netwk Science  3 Credit Hours
This course presents an in-depth study of various types of information networks, which range from the structure and behavior of the world-wide web, to the structure and behavior of various collaboration networks, such as bibliographic citations, viral marketing, and online social networks. Using concepts from graph theory and game theory, topics include small-world networks, scale-free networks, the structure of the web, link analysis and web search, and influence networks.
Prerequisite(s): CIS 505
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 560  Electronic Commerce  3 Credit Hours
This course examines how new information technologies and networks affect the exchange of goods and services between buyers and sellers in firms. What are economics of different electronic commerce models for firms? The course combines critical evaluation of business strategies with hands-on experience in building supporting electronic commerce systems utilizing electronic data interchange (EDI) software. (YR).
Prerequisite(s): CIS 564 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

CIS 562  Web Information Management  3 Credit Hours
This course provides an in-depth examination of advances in web information management, retrieval and applications. Topics covered include: web interfaces to databases, XML standards, web database design, web database architectures, web query languages, web data restructuring, web information integration, semantic web and ontologies, and web mining. (YR)
Prerequisite(s): CIS 556 or CIS 421
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

CIS 563  Modeling of Computer-based Sys  3 Credit Hours
The purpose is to expose the students to modeling and simulation concepts and methodologies to use modeling and simulation as a tool for both the analysis of systems and the development of their information systems support.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Computer & Information Science

CIS 564  Enterprise Information Systems  3 Credit Hours
The purpose of this course is to provide a foundation for the analysis, design and implementation of enterprise information systems. Topics include systems and organization theories, and information systems planning and evaluation. Students will be also introduced to various systems development life cycle phases of an enterprise information system. Students will acquire an understanding of the flow of information (forecasts, financial, accounting and operational data) within an enterprise and the factors that should be considered in designing an integrated enterprise information system. This includes all systems in the business cycle from revenue forecasts, production planning, inventory management, logistics, manufacturing, accounts payable, sales, accounts receivable, payroll, general ledger and report generation. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 applications development software suite. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

CIS 565  Software Quality Assurance  3 Credit Hours
This course focuses on the processes, methods, and techniques for developing quality software, and maintaining quality software. Software testing processes at the unit, module, subsystem, and systems levels are discussed. Testing methods covered include: automatic and manual generation of test data, static vs. dynamic analysis, functional testing, inspections, and reliability assessment.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if College is Engineering and Computer Science
CIS 566  Software Arch and Des Patterns  3 Credit Hours
A design pattern is a catalogued solution that has been applied and
tested in multiple situations to produce well-designed reusable object-
oriented software. This course covers both architectural and software
design patterns in theory and in practice, with various applications. The
course will end with a case study and design exercise demonstrating
identification and utilization of architectural design patterns in real world
application. The students will test their understanding by completing
three projects utilizing popular design patterns and a term project
utilizing multitude of patterns. Class presentation of published advanced
patterns may be required.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 568  Data Mining  3 Credit Hours
Advances in computer information systems, machine learning, statistics,
and intelligent systems and methodologies for the automatic discovery
of knowledge from large high-dimensional databases. This course also
uses engineering development tools such as neural networks, fuzzy logic,
and genetic algorithms.
Prerequisite(s): ECE 479 or CIS 479
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 569  Wireless Sensor Networks  3 Credit Hours
This course provides students with an overview of wireless sensor
networks and the issues related to their design and implementation. It
introduces students to the state-of-the-art in wireless sensor networking
and helps them solve problems in designing and deploying resource-
limited sensor networks for real-world sensing applications. During this
course, students are required to work in teams to design and implement
some primitive sensing applications.
Prerequisite(s): CIS 527
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 5700  Advanced Data Mining  3 Credit Hours
This course provides an in-depth study of advanced data mining, data
analysis and pattern recognition concepts and algorithms. Course
content builds upon a first data mining course and explores advanced
machine learning algorithms, high-dimensional data, graph and temporal
data, and advanced methods and applications to deal with dynamic
stream data. Various applications will be considered, including social
networks and health informatics. Students will be able to understand the
research methods applied in the field and conduct an end-to-end data
mining project and document and present the results.
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

CIS 571  Web Services  3 Credit Hours
A study of the major concepts and techniques for enabling web service-
based interactions on the web. The objective is to familiarize students
with the recent trends in industry and academia to address web service
research issues. The course will address various aspects of web services,
including the reference model for web services (UUDI, SOAP WSDL), web
service composition, semantic web services, security/privacy issues in
web services and an overview of web service standards (BPEL4WS, WS-
Security, etc). Students will participate in a major project.
Prerequisite(s): CIS 350 or ECE 370
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 572  Object Oriented Systems Design  3 Credit Hours
Students will be introduced to fundamental concepts and methods of
object design and development. Topics that will be covered include object
database concepts, data models, schema design (conceptual schema
and physical schemas), query languages, physical storage of objects
and indexes on objects, version management, schema evolution and
systems issues such as concurrent control and recovery from failure. For
application programming, a programming language such as C++ will be
used for database design and query language. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate
NCFD or Graduate

CIS 574  Compiler Design  3 Credit Hours
Lexical analysis and symbol table; syntactical analysis of expressions
and statements; error detection; translation into intermediate code and
its correctness. (YR).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and
MATH 276)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

CIS 575  Software Engineering Mgmt  3 Credit Hours
Quantitative models of the software lifecycle; cost-effectiveness;
uncertainty and risk analysis; planning and modeling a software
project; software cost estimation (COCOMO, Function points); software
engineering metrics; software project documentation. Special emphasis
on emerging software process standards such as the Capability Maturity
Model of the Software Engineering Institute, and other international ones.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 577  S/W User Interface Dsgn&Analys  3 Credit Hours
This course introduces current theory and design techniques concerning
how user interface (UI) and user experience (UX) should be designed and
assessed to be easy to learn and use. Course includes flowing general
modules: introduction of HCI & UX; Interface/Interaction design strategy;
Advanced Issues in HCI; and Evaluation methods.
Prerequisite(s): CIS 553*
Restriction(s):
Can enroll if College is Engineering and Computer Science
CIS 578  Advanced Operating Systems  3 Credit Hours
Advanced techniques used in operating system design. Distributed operating systems. Message-based operating systems. Operating systems for parallel architectures. Layered techniques in operating systems. Formal models of operating systems. Current trends in operating system design. (YR).
Prerequisite(s): CIS 450 or IMSE 450 or ECE 478
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 579  Artificial Intelligence  3 Credit Hours
This course introduces students to the essential concepts, methods, and techniques of artificial intelligence (AI) from a computer science perspective. The general topics of the course will include a variety of knowledge representations and algorithms for interference, decision-making, planning, and learning. Modern intelligent systems, including those that can handle uncertainty, will serve to motivate the course material. The course will cover topics at a depth appropriate for an introductory AI course at the graduate level. A student project may be required.
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276)
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 580  Data Analytics in Software Eng  3 Credit Hours
Full Course Title: Data Analytics in Software Engineering-This course focuses on state-of-the-art methods, tools, and techniques for evolving software. Topics such as reverse engineering, design recovery, program analysis, program transformation, refactoring, and traceability will be covered. There will be a project in which student teams participate.
Prerequisite(s): CIS 553

CIS 584  Adv Comp Net Sec  3 Credit Hours
This course consists of an in-depth examination of current technological advancements in computer and network security. Topics will include secure group communication (key generation, distribution, and management), secure routing and multicasting, identity-based encryption, digital signatures, broadcast authentication, device pairing, and malware/intrusion detection and mitigation.
Prerequisite(s): CIS 544
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 585  Adv AI  3 Credit Hours
This course will cover the most recent advances in the theory and practice of artificial intelligence, from a computer-science perspective. Topics covered will include the state-of-the-art in knowledge representation, uncertainty, learning, CSPs, graphical models, multi-agent systems, algorithms and heuristics, and propagation-based techniques. Various application areas will be taken from security, game theory, economics, finance, biology, sociology, and big data. (W)
Prerequisite(s): CIS 579
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

CIS 586  Advanced Data Management  3 Credit Hours
This course provides an in-depth examination of some advanced database technologies. Topics are selected from: object-relational databases, active databases, distributed databases, parallel databases, deductive databases, fuzzy databases, data warehousing and data mining, spatial and temporal databases, multimedia databases, advanced transaction processing, information retrieval and database security.
Prerequisite(s): CIS 556
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 587  Computer Game Design and Impl  3 Credit Hours
This course deals with the study of the technology, science, and art involved in the creation of computer games. The focus of the course will be hands-on development of computer games. Students will study a variety of software technologies relevant to computer game design, including: programming languages, scripting languages, operating systems, file systems, networks, simulation engines, and multi-media design systems. Lecture and discussion topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, real-time processing, game theory, software engineering, human computer interaction, graphic design, and game aesthetics. (YR)
Prerequisite(s): CIS 553*
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Engineering and Computer Science

CIS 588  Computer Game Design II  3 Credit Hours
This course is a continuation of the material studied in CIS 587. The focus of the course will be hands-on development of computer game development tools (e.g. game engines). Students will study a variety of software technologies relevant to computer game design, including: 3D graphics, computer animation, data-driven game design, multiplayer game programming, and game AI. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, game theory, software engineering, human computer interaction, and game content development, and game aesthetics.
Prerequisite(s): CIS 587
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Software Engineering, Computer & Information Science

CIS 590  Selected Topics  1 to 3 Credit Hours
In-depth study of a CIS topic of contemporary interest. Topic varies from semester to semester.
Restriction(s):
Can enroll if Class is Graduate
CIS 590I  Select Topics in CIS  3 Credit Hours
Topic: Large Scale Enterprise Computing. This course helps students gain an understanding of the reasons companies chose large scale systems to run (and grow) their computing environments. Topics include capacity, scalability, integrity and security, availability, access to large amounts of data, systems management, and autonomic capabilities. Large scale enterprise computing technologies power all 50 of the top 50 worldwide banks and 22 of the top 25 U.S. retailers. The course provides a broad understanding of networking principles and the hardware and software components necessary to allow large scale systems to participate in a high volume data communications network. It discusses security principles and the hardware and software components needed to insure that the large scale systems resources and environment are secure.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

CIS 591  Directed Research Project  1 to 3 Credit Hours
Special projects for laboratory or library investigation with the intent of developing initiative and resourcefulness. The student will submit a report of the project and give an oral presentation to a panel of faculty members at the close of the term.
Restriction(s):
Can enroll if Class is Graduate

CIS 624  Res Adv Cmp Net Sec  3 Credit Hours
An in-depth study of the current state-of-the-art in computer and network security. Selected topics will be from areas such as social network security, sensor network security, information and network provenance, cyber-physical system security, pervasive and mobile computing security, smart-grid security, and healthcare system security and privacy.
Prerequisite(s): CIS 584
Restriction(s):
Can enroll if Class is Graduate

CIS 647  Rsrch Advances Ntwkng&Dist Sys  3 Credit Hours
This course presents an in-depth study of such topics as Internet analysis, approaches for network performance enhancements, multimedia applications, network coding, routing techniques, congestion control, wireless and sensor networks, vehicular networks, social networks, network science, and other emerging networking technologies and applications.
Prerequisite(s): CIS 537
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 652  Info Visualztion & Comp Anim  3 Credit Hours
This course introduces algorithms for three-dimensional imaging, geometric modeling, geometric processing, information visualization, and computer animation. Particular research topics include volume graphics, point-based graphics, surface reconstruction, wavelet and subdivision methods, level of details, and physics-based animation. Students will study state-of-the-art papers in the above areas and be involved in a course project.
Prerequisite(s): CIS 551
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 658  Research Advances in Data Mgt  3 Credit Hours
An in-depth study of special topics of current interest in database systems. Selected topics will be from areas such as query optimization for emerging database systems, indexing for non-traditional data, data provenance for scientific databases, databases on modern hardware, self-managing databases, information integration and retrieval, bioinformatics, or other emerging database areas/applications.
Prerequisite(s): CIS 586
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 676  Soft Arch Des & Analysis  3 Credit Hours
This course provides in-depth coverage of the concepts needed to effectively design and analyze software architectures. It introduces major architectural styles and design patterns and illustrates their application in designing and analyzing modern software architectures such as wireless, service-oriented, and security-based systems. The course also studies software architecture documentation practices that meet the needs of the entire architecture stakeholder community.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 678  Research Advances Software Eng  3 Credit Hours
An in-depth study of the current state-of-the-art in software engineering. Selected topics will be from areas such as software maintenance, software testing, model-driven engineering, human factors in software engineering, software specifications, software management, emerging technology and applications, applying optimization techniques in software engineering, and empirical software engineering.
Prerequisite(s): CIS 565
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 679  Computational Game Theory  3 Credit Hours
This course will introduce students to fundamental concepts and results in the area of computational game theory and economics, and expose them to the state-of-the-art and applications, providing them with the ability to make significant contributions to this quickly developing research area. This emerging area is at the interface of computer science and economics and seeks to build on classical results in game theory to provide practical models and effective algorithms better suited to study and solve problems in large complex systems in modern society. Of major interest are compact models and efficient algorithms to understand and predict the complex global behavior that emerges from local interactions. Auctions, the Internet, social networks, computational biology, and interdependent security are some example application domains. (F).
Prerequisite(s): CIS 579
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 685  Res Adv in Art Intell  3 Credit Hours
Full Course Title: Research Advances in Artificial Intelligence. An in-depth study of the current state-of-the-art in artificial intelligence. Selected topics will be from areas such as analytics, advanced neural nets and deep learning, multi-agent systems, auctions, cooperation, competition, genetic algorithms and evolutionary computing, swarm intelligence, game-theoretic approaches to decision and policy making, advanced techniques for natural language processing, and advanced techniques in knowledge discovery. (F)
Prerequisite(s): CIS 585
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or
Can enroll if College is Engineering and Computer Science
CIS 691  Adv Dir Study  1 to 3 Credit Hours
Advanced Directed Studies: Special topic in computer and information science. A project report and a seminar are required.
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science

CIS 695  Master's Project  3 Credit Hours
Application of the methodologies, tools and theory of software engineering to produce a specific validated software product. Projects can be faculty-generated, self-generated, and/or work related. All projects must be undertaken with one or more students under the supervision of the instructor. Prior to enrollment, a project proposal must be prepared and approved by the instructor and department chair. Standard software engineering documents must be prepared and approved at each phase of the project, and an oral presentation of the project is required. Course includes lectures and case studies. Permission of instructor required.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Program is MS-Software Engineering, MS-Computer & Information Sci

CIS 699  Master's Thesis  1 to 6 Credit Hours
Graduate students electing this course, while working under the general supervision of a member of the department faculty, are expected to plan and carry out the work themselves and submit a thesis for review and approval, and also present an oral defense of the thesis.
Restriction(s):
Can enroll if Class is Graduate

CIS 791  Adv Guided Study  2 to 6 Credit Hours
This is a guided study course for doctoral students on an advanced topic of research. A report and an oral presentation are required.
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science

CIS 798  Doctoral Seminar  0 Credit Hours
After attaining candidacy, every Ph.D. student is required to attend and actively participate in seminars each semester until graduation. In addition, each Ph.D. student is required to present a one-hour seminar about his/her research on a pre-assigned research topic, as well as lead a follow-up discussion on the future trends in his/her field. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is Computer & Information Science

CIS 980  Pre-Cand Dissertation Research  1 to 9 Credit Hours
Full Title: Pre-Candidate Dissertation Research Dissertation work by a pre-candidate student in Computer and Information Sciences program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate
Can enroll if Major is Computer & Information Science

CIS 990  Doctoral Dissertation  1 to 9 Credit Hours
Dissertation work by a student of the Ph.D. in Computer and Information Science program, conducted under guidance of the faculty advisor. The student must be a Ph.D. candidate. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is Computer & Information Science

CIS 991  Doctoral Seminar  0 Credit Hours
A seminar on the current research of the Ph.D. students. Students will be asked to present a talk on their research. (F,W,S)

CRJ 509  Intel and Homeland Security  3 Credit Hours
Full Title: Intelligence and Homeland Security This course will provide an in-depth examination of the principles that guide the collection, analysis, and sharing of intelligence in the United States and how these principles impact homeland security. Topics will include the US Intelligence Community (CIA, FBI, military intelligence), the National Criminal Intelligence Sharing Plan, the National Intelligence Strategy, and the recent emphasis places on Intelligence-Led Policing. Emphasis will also be placed on the increased role that local and state law enforcement agencies as well as private sector entities play in contributing to the assessment of threats to homeland security. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

CRJ 513  American Constitutional Law  3 Credit Hours
A major theme of this course is the development of the constitution, especially focusing on the themes of judicial review, judicial self-restraint and judicial activism; the expansion of executive and legislative powers; and the rise of “substantive due process of the law”. Prerequisite or equivalent recommended. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Graduate

CRJ 514  Civil Rights and Liberties  3 Credit Hours
An analysis of the Bill of Rights and the 14th Amendment, with particular emphasis upon recent landmark or controversial Supreme Court decisions dealing with freedom of speech and religion, rights of criminal defendants; cruel and unusual punishment, right to privacy; civil rights and equal protection clause; and apportionment. Prerequisite or equivalent recommended. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Graduate

CRJ 515  Restorative Justice  3 Credit Hours
This graduate course explores the practice of restorative justice as it has been engaged in historical and contemporary criminal justice contexts. Topics addressed include the principles and philosophies underlying restorative justice, differences between retributive and restorative models, victim-offender dialogue, and offender reintegration. Students will be asked to think critically about restorative and retributive systems and to apply these concepts to develop their own approach to restorative justice.

An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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CRJ 517  Crimmigration  3 Credit Hours
Full Title: Crimmigration: Intersections of Immigration and Criminal Justice
This course explores the intersection(s) of the criminal justice and immigration systems with special attention to race, class, and gender. It covers the evolution of American immigration policy and its application, the criminalization of immigrants, immigrant offending and victimization, the policing of immigrant communities, and the immigrant experience in the United States.
Prerequisite(s): CRJ 200 or CRJ 468 or CRJ 473 or SOC 200 or SOC 201

CRJ 518  CJ Research Methods  4 Credit Hours
Full Title: Criminal Justice Research Methods
This course provides an introduction to methods of data collection and analysis, as well as a discussion of research design and the philosophy of social science, within the context of the field of Criminology and Criminal Justice. Attention is given to quantitative, qualitative, and mixed methodologies.
Restriction(s):
Can enroll if Level is Graduate

CRJ 543  Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both SOC 443 and SOC 543. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Graduate

CRJ 546  Marriage and Family Problems  3 Credit Hours
Sociological analysis of problems encountered within the institution of marriage with particular reference to such issues as choosing a marriage partner, sexual adjustment, occupational involvement, conflict resolution, child rearing, divorce and readjustment. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 547  Family Violence  3 Credit Hours
Sociological analysis of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering, and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Permission of instructor is an optional prerequisite. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): SOC 200 or SOC 201 or SOC 301 or SOC 443 or PSYC 405 or WST 405
Restriction(s):
Can enroll if Class is Graduate

CRJ 553  Sociology of Law  3 Credit Hours
Various aspects of the relationship between law and society are explored. After a look at processes of law making, attention is turned to the administration of law. This involves a study of the activities of legislatures, courts, police, and correctional agents. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 555  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including: (1) formation and perseverance of immigrant communities and inter-ethnic boundaries; (2) relations between the homeland and the immigrant; and (3) impact of migration on family life and gender roles. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).
Prerequisite(s): ANTH 101 or WST 275 or WGST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303
Restriction(s):
Can enroll if Class is Graduate

CRJ 560  Law and Culture  3 Credit Hours
This course will explore the ways in which legal rules, norms, and processes are embedded in and shaped by the societies in which they are created and disseminated. We will address anthropological and sociological theories about the nature of law and disputes, examine related studies of legal structures in non-Western cultures, and consider the uses of sociology and anthropology in studying our own legal system. By examining individual legal institutions in the context of their particular cultural settings, we can begin to make cross-cultural comparisons and contrasts. In so doing, we confront the challenge of interpreting and understanding the legal rules and institutions of other cultures while assessing the impact of our own social norms and biases. (F,W)
Restriction(s):
Can enroll if Level is Graduate

CRJ 565  Deviant Behavior/Soc Disorganz  3 Credit Hours
General analysis of the concepts of social deviance and social disorganizations: factors producing each condition, the effects of social control measures on the course of deviance and disorganization consequences for the social system, and the relationship between the two concepts. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 566  Drugs, Alcohol, and Society  3 Credit Hours
Analyses of the sociology of substance use and abuse. Provide a sociological framework for understanding issues and evaluating our nation's responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American Society. Additional assignments will distinguish this course from its undergraduate version.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate
CRJ 568  Criminology  3 Credit Hours
Analysis of criminal behavior in relationship to the institutional framework of society. Emphasis upon the more routinized and persistent forms of criminality along with the joint roles played by victims, the criminal, the police, and all other relevant parties. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (F, W).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 569  Juvenile Delinquency  3 Credit Hours
The analysis of juvenile delinquent behavior in relationship to the institutional framework of society. Emphasis on the extent, causes, and methods of treatment of juvenile delinquency in the United States. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 570  Current Issues in Crim Justice  3 Credit Hours
Current issues in the field of criminal justice and law enforcement in the US and other countries. Topics include an evaluation of police activities, problems of apprehensions and prosecution, the courts and the correctional system, and the efficacy of the legal structure in its social context. Prerequisite or permission of instructor. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (F, W, S).
Prerequisite(s): CRJ 200
Restriction(s):
Can enroll if Class is Graduate

CRJ 571  Int'l Criminal Justice Systems  3 Credit Hours
Description, analysis, and evaluation of selected criminal justice systems throughout the world. Course focuses on the various systems, theories, structures, methods, and functions, including common law systems and socialist law systems. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 572  Correctional Systems  3 Credit Hours
Analysis of the legal, social and political issues affecting contemporary correctional theory and practice. Topics covered include the history of corrections; the nature of existing institutions; the functions and social structure of correctional institutions; and alternatives to institutional incarceration; probation and parole. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (OC).
Restriction(s):
Can enroll if Class is Graduate

CRJ 580  Applied CJ Theory  3 Credit Hours
Full Course Title: Applied Criminal Justice Theory Criminal Justice theories emphasize the study of formal and informal mechanisms of social control in specific places, such as bars and night clubs, city parks, schools, and shopping malls. This course will include a comprehensive assessment of Criminal Justice theories as well as key principles of human behavior that may be impacted by formal or informal mechanisms of social control. As an applied theory course, students will also be introduced to a process by which theories and principles can be translated into daily practical use in place where behavioral problems frequently occur. (YR)
Prerequisite(s): CRJ 200 and CRJ 468 and CRJ 473 and SOC 200 or SOC 201

CRJ 582  Legal Ethics  3 Credit Hours
This course will explore the many ethical dilemmas faced by professionals in the legal system. We will pay particular attention to the criminal justice system and to the Rules of Professional Conduct for attorneys. Some of the questions we may address are: How should an attorney consider his/her own ethical beliefs when deciding the appropriate course of action in a case? How should a judge consider his/ her own ethical beliefs when making a juvenile justice decision? How should a police offer determine the ethical course of action when the law's instructions are ambiguous? (F,W)
Restriction(s):
Can enroll if Level is Graduate

CRJ 584  White Collar Crime  3 Credit Hours
This course reviews the history, categories, and problems related to white-collar crime. The course covers these topics by incorporating both legal and empirical perspectives in the study of white collar crime. In this course, we will focus on the substantive and procedural white collar crime laws ('law on the books') and analyze real white collar crime cases. Simultaneously, we will pay special attention to the dynamic relationship between white color crime and the American regulatory framework. As a result, we will assess the relationship and differences between various types of white collar crime and the regulatory regimes that oversee the business sector (‘law in action’). (OC)

CRJ 588  Criminal Procedure  3 Credit Hours
Full Title: Criminal Procedure and Constitutional Law This class is a study of Constitutional law regarding criminal procedure in the United States. Initially the class reviews the federal and state court structure relating to criminal prosecutions and the flow of cases through those systems. The focus in then on the nature of individual rights under the Constitution, the case law, and the concept of the "exclusionary rule." The class then examines specific issues and procedures relating to arrests, searches, confessions and identifications, and analyzes the constitutional requirements for each. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

CRJ 590  Topics in Criminal Justice  3 Credit Hours
Examination of problems and issues in selected areas of criminal justice. Title as listed in Schedule of Classes will change according to the content of the course. Course may be repeated for credit when specific topics differ. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research.
Restriction(s):
Can enroll if Class is Graduate

CRJ 598  Directed Studies  1 to 6 Credit Hours
Directed individual study of any subject agreed upon by the student and the instructor. May not duplicate a formal course offering. (F, S, W).
CRJ 599  CRJ Master's Essay  3 Credit Hours
Full Title: Criminology & Criminal Justice Essay
Criminology and Criminal Justice Master's degree non-thesis students must complete a major essay addressing the application of substantive or theoretical issues in criminology or criminal justice to current issues or practices in the field. The major paper may be based on papers completed in other graduate courses but must be of higher quality and depth than a usual term paper. The topic must be approved in advance, and approved upon completion, by the graduate faculty advisor.

Restriction(s):
Can enroll if Level is Graduate
Can enroll if Major is Criminal Justice Studies, Criminology & Criminal Justice

CRJ 699  CRJ Thesis  4 Credit Hours
Full Title: Criminology & Criminal Justice Thesis
Students electing the Thesis option in the last stage of the MS in Criminology & Criminal Justice program will work under the general supervision of a member of the graduate faculty in the Criminology & Criminal Justice Program but will plan and carry out the work independently. Students should obtain a copy of the thesis requirements from the CASL Office of Graduate Programs or the Program Director before registering for this course. The student will submit a report on the thesis and give an oral presentation to a panel of faculty members when the thesis is completed.

Prerequisite(s): CRJ 518

Restriction(s):
Can enroll if Level is Graduate
Can enroll if Major is Criminal Justice Studies, Criminology & Criminal Justice

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F-W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Decision Sciences (DS)

DS 500  Accelerated Statistics  2 Credit Hours
This course will introduce fundamental concepts and methods in data analysis, probability, estimation, and statistical inference for application in management and management science. Topics include: basic probability theory, discrete and continuous random variables and distributions, sample and data analysis, sampling distributions, estimation, confidence intervals and hypothesis testing, introductory regression analysis, and utilization of statistical software packages. The course is designed to fulfill the statistics prerequisite for admission to SOM graduate degree programs, and is open only to those with strong mathematics backgrounds. Prerequisite: By permission of the Graduate Programs Office.

Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

DS 503  Managerial Stats and Opt I  3 Credit Hours
To develop basic competence and judgment in the application of quantitative methods for the analysis of probabilistic decision problems. Topics include: structure of probabilistic decision problems, probability theory and applications, statistical estimation and hypothesis testing, data collection and analysis, and applications. Selected software packages are used in homework and laboratory sessions.

Restriction(s):
Can enroll if Class is Graduate

DS 520  Applied Statistical Modeling  3 Credit Hours
This course explores statistical modeling and analysis techniques for aiding managerial decision making. Topics include: introduction to descriptive statistics, sampling methods and sampling distribution, confidence interval estimation, one sample hypothesis tests, one-way and two-way analysis of variance, simple and multiple linear and nonlinear regressions, and time series forecasting. Selected software packages are used in exercises, projects, and business case examples.

Restriction(s):
Can enroll if Class is Graduate

DS 553  Managerial Stats and Opt II  3 Credit Hours
To develop basic competence and judgment in the application of quantitative analysis to the solution of decision problems. Topics include: univariate and multivariate regression analysis, one-way analysis of variance (ANOVA), linear programming, integer programming, and network models. Selected software packages are used in homework and laboratory exercises.

Prerequisite(s): DS 503

DS 570  Management Science  3 Credit Hours
To develop basic competence in introductory management science and operations research. Topics include: problem formulation and model development in optimization, linear programming (LP), duality theory, economic interpretation, and sensitivity analysis, introduction to integer programming (IP), special linear programs, network modeling, and introduction to non-linear programming (NLP). Selected software packages are used in laboratory exercises and in optimization project.

Restriction(s):
Can enroll if Class is Graduate

DS 630  Applied Forecasting  3 Credit Hours
This course explores various quantitative modeling methods used in forecasting. Topics include: moving averages, various smoothing techniques, trend- and seasonal forecasting, univariate- and multivariate regression based time series analysis (ARMA, ARIMA). Selected software packages are used in laboratory exercises and in an applied forecasting project.

Prerequisite(s): DS 520 or IMSE 514

DS 631  Decision Analysis  3 Credit Hours
This course entails study of analytic techniques for rational decision making that address uncertainty, conflicting objectives, and risk attitudes. Topics covered in the course include modeling uncertainty, rational decision making principles, representing decision problems with value trees, decision trees and influence diagrams; solving value hierarchies, decision trees and influence diagrams; defining and calculating the value of information, incorporating risk attitudes into the analysis and conducting sensitivity analysis.

Prerequisite(s): DS 520 or IMSE 514

Restriction(s):
Can enroll if Class is Graduate
The following abbreviations are used to denote the frequency of offering:

- (F) fall term
- (W) winter term
- (S) summer term
- (F, W) fall and winter terms
- (YR) once a year
- (AY) alternating years
- (OC) offered occasionally

### Economics (ECON)

#### ECON 5011 Monetary Economics 3 Credit Hours
This course examines financial institutions in a macroeconomic theoretical context. A rigorous treatment of monetary theory is presented followed by practical discussion of U.S. monetary policy as implemented by the Federal Reserve System. Students cannot receive credit for ECON 411 and ECON 4011 or ECON 5011.

**Prerequisite(s):** ECON 311 and ECON 301

**Restriction(s):**
- Can enroll if Class is Graduate
- Can enroll if Major is Public Policy, Economics

#### ECON 5015 Introduction to Econometrics 3 Credit Hours
The theory and practice of the statistical analysis of economic relationships. Topics covered include the construction and estimation of econometric models and tests of economic theories, emphasizing the use of multiple linear regression. Students cannot receive credit for ECON415 and ECON 4015 or ECON 5015.

**Prerequisite(s):** MATH 113 or MATH 115 and ECON 305

**Restriction(s):**
- Can enroll if Class is Graduate
- Can enroll if Major is Public Policy, Economics

#### ECON 5021 Economics of the Labor Sector 3 Credit Hours
Theoretical analysis and empirical studies of the nature and operation of labor markets. Includes theories of wage determination and income distribution, the nature of unemployment, the impact of collective bargaining on the economy, the extent and economic effects of discrimination, and the nature and effects of government wage and employment policies. Students cannot receive credit for ECON 421 and ECON 4021 or ECON 5021.

**Prerequisite(s):** ECON 302

**Restriction(s):**
- Can enroll if Class is Graduate

#### ECON 503 Economics and Public Policy 3 Credit Hours
In this course students will review basic neoclassical economic theory and learn to apply it to the analysis of public policy issues. Economics offers important insights into the behavior of businesses, consumers, and government entities. We will review key economic concepts, applying each to an array of public policy questions. Next we'll evaluate resource allocation via the market system and consider how public policy might address situations where the market fails to produce desirable results. Lastly, we'll learn about the basic tools economists use to evaluate public policies.

**Prerequisite(s):** (ECON 201 and ECON 202) or PPOL 500

**Restriction(s):**
- Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
- Cannot enroll if College is Engineering and Computer Science

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* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
ECON 5065  History of Economic Thought  3 Credit Hours
Course examines the evolution of economic thought and theory from the early origins to the present, focusing on the major contributions to economics, especially from Adam Smith onward, and assesses the current condition of economic analysis. Students cannot receive credit for ECON 465 and ECON 4065 or ECON 5065.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Class is Graduate

ECON 5085  Public Finance  3 Credit Hours
Analysis of the role of government in the economy. Course examines theories of the need for and nature of government intervention in economic activities. Includes analysis of public goods, externalities, taxation, state, and local finance, and models of public decision making. Students cannot receive credit for ECON 481 and ECON 4085 or ECON 5085.
Prerequisite(s): ECON 302
Restriction(s):
Can enroll if Class is Graduate

ECON 533  Antitrust and Regulation  3 Credit Hours
This course uses economic theory to examine major antitrust laws and to evaluate government regulation of industry. ECON 331, Industrial Organization, is valuable background to this course although it is not a prerequisite. Students cannot receive credit for ECON333 and ECON433 or ECON533(OC).
Prerequisite(s): ECON 202

ECON 537  Behavioral Public Policy  3 Credit Hours
This course teaches you to apply the insights from behavioral economics and psychology to public policy design. Empirically-based behavioral science offers policy makers the opportunity to decrease the impact of psychological limitations of lazy or boundedly rational individuals. In this course we consider various public policies that are informed by behavioral science research in the areas of retirement savings, household borrowing, health care, energy use and choice of nutrition. (AY, S).
Prerequisite(s): ECON 201 and ECON 202
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Cannot enroll if Program is

ECON 538  Beh Econ for Business & Policy  3 Credit Hours
This course is a reading intensive seminar on behavioral economics, which is the combination of psychology and economics that investigates what happens in markets in which some agents display human limitations and complications. The course focuses on the behavioral economics theory and its' application to business practice and policy decision making. Specifically, in this course we: (1) examine the ways in which people deviate from the standard economics models, including irrationality, preferences for fairness, prosperity to cooperate, trust, dual-interest, empathy, and emotions; (2) explore behavioral economics theories and models; discuss how the behavioral economics theories and models can be applied to solve business and policy problems. Graduate version of the course requires completion of additional assignments. Students cannot receive credit for ECON 336 and ECON 438 or ECON 538. (F,W,AY)
Restriction(s):
Can enroll if Class is Specialist or Graduate or Doctorate

ECON 542  Economic Development  3 Credit Hours
A survey of economic problems currently affecting third world countries and the various policy options available to them. Topics covered will include agrarian vs. industrial growth, and monetary and fiscal policies, planning problems, foreign exchange and debt problems. Students cannot receive credit for ECON 342 and ECON442 or ECON 542(OC).
Prerequisite(s): ECON 201
Restriction(s):
Can enroll if Class is Graduate

ECON 544  Economies of the Middle East  3 Credit Hours
Survey of socio-economic issues of the post-WWII Middle East, using textbooks and web-based readings. Topics include population growth, urbanization, migration, gender issues, land reform, privatization, and stabilization policies. The Arab-Israeli conflict is not a focus of study. Grade based on papers and exams. Students cannot receive credit for ECON 344 and ECON 444 or ECON 544.
Prerequisite(s): ECON 201 or ECON 202
Restriction(s):
Can enroll if Class is Graduate

ECON 547  International Finance  3 Credit Hours
This course studies the large-scale economic issues in interdependent economies, such as the behavior of exchange rates, interest rates, income, wealth, prices, and the balance of payments. International finance focuses particularly on economic policies in a world with a multitude of currencies and increasingly integrated goods, financial, and capital markets. Students cannot receive credit for ECON 347 and ECON 447 or ECON 547.
Prerequisite(s): ECON 201
Restriction(s):
Can enroll if Level is Graduate
Can enroll if Major is Public Policy, Economics

ECON 548  International Trade  3 Credit Hours
Course analyzes in depth the debate of free trade vs. protectionism. Different theoretical models of the "gains from trade" are presented, as well as studies of their empirical validity. Some historical perspective is included, as well as discussion of the current situation of the European Union. Students cannot receive credit for ECON348 and ECON 448 or ECON 548.
Prerequisite(s): ECON 201 or ECON 202
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Program is MPP-Public Policy

ECON 582  Regional Economics  3 Credit Hours
Course explores methods of economics evaluation of regions in terms of intra- and inter-regional activity. Regions may smaller than a nation, be a collection of nations, or be composed of portions of more than one nation. Theoretical topics include the theories of (1) the location of the firm, (2) spatial demand, (3) agglomeration economies, and (4) input-output analysis. Regional development policy is discussed using Michigan and Ontario as subjects. Students cannot receive credit for both ECON382 and ECON482.
Prerequisite(s): ECON 201 or ECON 202 or ECON 2001
Restriction(s):
Can enroll if Class is Graduate
EDA 500 Theoretical Foundations of Ed 3 Credit Hours
This is an advanced seminar course in educational theory. It involves a systematic examination of numerous theories that have played a major role in shaping American education. Among these are: 1) ideologies, 2) ethical theories, 3) learning theories, 4) instructional theories, and 5) theories of study. These have provided education with different moral outlooks, different social objectives, different curricula, and different teaching methods.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDA 501 Adv Social Fndtions of Ed 3 Credit Hours
This advanced seminar will investigate various aspects of formal education taking into account historical, philosophical, political, social, cultural, religious and economic contexts. Within these contexts, the course will identify and examine school reform and change issues and trends as they relate to complex and rapidly changing local, national and global society.
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Education, Health, and Human Services

EDA 515 Comm & Schools: Partnerships 3 Credit Hours
Communities and Schools: Building and Sustaining Partnerships offers an examination of the role that communities play in schools’ achieving public aims and the value that alliances have on the overall delivery of instruction. Thus, the course reviews various arguments and presents the student learner with the opportunity to connect the theory to practice so that she/he can develop her/his own views on the need and value of these methods. (YR)

EDA 519 Early Literacy/Language Devel 3 Credit Hours
This course examines early language development, the factors that contribute to its growth and the role that it plays in the development of literacy. Diagnostic techniques for assessing language and literacy and teaching strategies and materials to facilitate language and literacy growth in children birth through third grade will be discussed.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

EDA 520 Community Action: Detroit 3 Credit Hours
Using the Detroit Metropolitan region as a case study, students will examine the local history of different types of community organization—grassroots citizen action groups, non-profit social service agencies, issue coalitions, and government-sponsored councils—as a way of understanding the concepts of self-interest, power, institutional change, community control, and leadership. The class will examine how history, ecology, culture, economics and individuals working in groups shape communities including Detroit. Through this examination, students will develop the understanding and skills needed to act as collaborators and leaders in the community working with different organizations to help empower citizens and affect social change. (YR)

EDA 521 Comm Based Edu Seminar 1 Credit Hour
This seminar is designed to support students pursuing the MA in Community Based Education. By developing an extended learning community the course will help students build connections between theory and practice by hosting regular research talks with local experts and professionals in the field. It will also support students in developing essential skills that will help them be successful in the field such as responding to an RFP, developing a conference proposal, writing for publication, and preparing a proposal for a foundation. (F) (W)

EDA 530 Loc Govt for Teach/Admin 1 to 3 Credit Hours
At the seminar, teachers participate in interactive learning activities with local government staff members. Officials serve as resource people, not lecturers. Teachers experience each lesson through the eyes of their students. All participants provide complete lesson plans for each activity, making it easy to share favorites from the course/academy with colleagues. Teachers work on developing coordinated learning experiences in local government including field trips, case studies and class visitsations drawn from both school district and local government resource-bases.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

EDA 550 Hist/Theory of Bilingual Educ 2 to 3 Credit Hours
This course provides an extensive background on bilingual education (programs where two languages are used as media of instruction) in the United States, and events that led to the inception of such programs on the Federal as well as the State levels. The course provides a background on the concept itself, its rationale and implementation. (OC)
Restriction(s):
Can enroll if Class is Graduate
EDA 555  Lang,Culture,Literacy & Power in Ed  3 Credit Hours
During this course we will examine the social/cultural functions of language with an emphasis on schools and other applied educational settings. Through our readings, discussions, and class activities, students will gain a greater appreciation for the ways in which language varies across cultures, social settings, and situations.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

EDA 610  Seminar in Critical Pedagogy  3 Credit Hours
This course will engage students in an in-depth study of pedagogy and will allow for the examination of their own disciplines through a critical theory lens. Students will be expected to problematize their disciplines core tenets and consider teaching for today's urban/metropolitan schools and curriculum.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

EDA 620  Public Pedagogy  3 Credit Hours
This course examines the out-of-school spaces and experiences in an effort to revision our understanding of what counts as education. Participants will complete case studies of the physical, social, and political places inhabited by the people in Detroit and the surrounding communities as a source for re-imaging teaching and learning in ways that connect the school and the community to empower students, teachers and the community to create educative experiences that cultivate their own agency in the community. (YR)

EDA 655  Lang,Culture,Literacy & Power in Ed  3 Credit Hours
During this course we will examine the social/cultural functions of language with an emphasis on schools and other applied educational settings. Through our readings, discussions, and class activities, students will gain a greater appreciation for the ways in which language varies across cultures, social settings, and situations.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

EDA 701  Adv Social Founds of Educ  3 Credit Hours
This advanced seminar will investigate various aspects of formal education taking into account historical, philosophical, political, social, cultural, religious and economic contexts. Within these contexts, the course will identify and examine school reform and change issues and trends as they relate to complex and rapidly changing local, national and global society.

Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

EDA 725  Seminar in Metropolitan Educ  3 Credit Hours
This seminar will take a social justice approach and systems analysis in viewing educational issues relevant to Metropolitan/Urban areas. It aims to understand education and schooling through a critical examination of the unequal power dynamics in society and offers alternatives.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Doctorate or

EDA 750  History/Theory Bilingual Ed  2 or 3 Credit Hours
This course provides an extensive background on bilingual education (programs where two languages are used as media of instruction) in the United States, and events that led to the inception of such programs on the Federal as well as the State levels. The course provides a background on the concept itself, its rationale and implementation. (OC)

Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

EDA 810  Seminar in Critical Pedagogy  3 Credit Hours
This course will engage students in an in-depth study of pedagogy and will allow for the examination of their own disciplines through a critical theory lens. Students will be expected to problematize their disciplines core tenets and consider teaching for today's urban/metropolitan schools and curriculum.

Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

EDA 820  Public Pedagogy  3 Credit Hours
This course examines the out-of-school spaces and experiences in an effort to revision our understanding of what counts as education. Participants will complete case studies of the physical, social, and political places inhabited by the people in Detroit and the surrounding communities as a source for re-imaging teaching and learning in ways that connect the school and the community to empower students, teachers and the community to create educative experiences that cultivate their own agency in the community.

Prerequisite(s): EDK 823 and EDK 825 and EDK 820

Restriction(s):
Can enroll if Level is Specialist or Rackham or Graduate or or Doctorate

EDA 855  Lang,Culture,Literacy & Power in Ed  3 Credit Hours
During this course we will examine the social/cultural functions of language with an emphasis on schools and other applied educational settings. Through our readings, discussions, and class activities, students will gain a greater appreciation for the ways in which language varies across cultures, social settings, and situations.

Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
EDB 500 Multicult Ed in US Classroom  3 Credit Hours
The theoretical concepts from the history of education, educational research, and the social sciences will form a base for studying educational trends, issues, and reforms in our society of diverse origins and outlooks. Topics for discussion may include: issues in reform movements; social, economic, pedagogical, and ethical problems related to education; and problems and prospects in international educational competition. The focus will be on institutional problems and processes related to quality education for pupils in our multicultural society.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDB 501 Leadership and Administration  3 Credit Hours
Administration and supervision of elementary, middle, and secondary school entails the analysis of organizational arrangements at both the classroom and school level. This course will deal with applications and practices that develop competencies and behaviors that educators need to supervise, evaluate, and lead organizational and instructional improvement efforts for school, staff, and students.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDB 502 School and Community Relations  3 Credit Hours
Examines interactions of schools and their communities: citizens' role/involvement in governance of education, internal and external communication concepts and practices, politics of education, community power and pressure groups, and organizational culture and climate.
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Degree is Education Specialist, MA in Educational Leadership, Doctor of Education

EDB 503 Reading Programs: K-12  3 Credit Hours
Overview of K-12 reading programs. Examines district, building, and classroom models, program development, implementation, and assessment/evaluation. Analysis of supervisory roles and leadership alternatives. Writing and technology connections will be explored.
Prerequisite(s): EDD 519
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
Can enroll if College is Education, Health, and Human Services

EDB 505 Intro to Educ Administration  3 Credit Hours
The course will provide an overview of educational administration and cover basic issues facing school administrators. It provides an introduction to the role of the school leader in contemporary educational programs and services. Students will examine opportunities in school administration and begin to develop a knowledge base for leadership in a variety of educational settings.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDB 507 Strategic Comm for Admin  3 Credit Hours
This Internet course addresses three levels of administrative communications - individual, group and organization - and examines the concepts and skills needed to be an effective communicator. Students will develop applications emphasizing goal-oriented communications and making strategic choices in content, structure, style and delivery. An emphasis is given to the design and best use of computer technologies such as Word and PowerPoint applications. The course also covers basic ethical and legal issues of work-place communications.
Restriction(s):
Can enroll if Class is Graduate

EDB 521 Current Issues in Early Ed  2 Credit Hours
Examines the expanding field of early childhood in order to understand major issues which are shaping the development and support of early education and child care programs. Designed for present and future teachers, administrators, and other workers in the field of early childhood, and for the general public who must participate in major pending decisions relating to such questions as proposed changes in state licensing, teacher certification, and funding sources.
Restriction(s):
Can enroll if Class is Graduate

EDB 522 Lead Advoc Admin Early Child  3 Credit Hours
This course promotes the role of the early childhood educator as a leader and advocate for young children and families. It is designed for present and future teachers, administrators and other professionals who participate in decisions relating to public policy legislation, state licensing, teacher certification, funding resources, parental involvement and other issues affecting young children and families.
Prerequisite(s): EDC 240
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if Level is Rackham or Graduate

EDB 523 Legal and Reg Issues in Ed  3 Credit Hours
This class will focus on important legal and regulatory issues related to public, education, and nonprofit organizations. It will consider the various court and administrative decisions which affect these. Numerous case situations will be used to facilitate the student's learning.
Restriction(s):
Can enroll if Level is Rackham or Graduate

EDB 524 Site-Based Management  2 Credit Hours
Site-based management in organizations is an evolving type of organizational improvement effort. Shared planning and participative decision-making are other related vehicles for enabling local organizational units to plan and execute their own processes, goals, and outcomes. An examination of the policies, practices, evolving research, impediments, and promoters of site-based management will be reviewed, along with case studies of success stories.
Restriction(s):
Can enroll if Level is Rackham or Graduate

EDB 540 School Budgeting and Finance  3 Credit Hours
Basic principles and actual practices of financial administration and accounting for state/local governments, public school systems, and nonprofit organizations, particularly budgeting and financial reporting within the context of other organizational processes and political demands and/or requirements. As one of the required seminars for the Educational Administration Certification, the case method will be employed to illustrate issues and problems of school financial administration.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
EDB 560  Admin of Human Resources  3 Credit Hours
This seminar will examine human resource administration activities in public, educational and nonprofit settings. Issues such as recruiting, selection, planning, performance appraisal, contracting and collective bargaining will be related to the overall administrative activities. Emphasis will be placed on the connections between human resource issues in public, education, and nonprofit organizations.
Restriction(s):
Can enroll if Class is Graduate

EDB 561  Organizational Dev and Theory  3 Credit Hours
Students will learn how organizations are structured and shaped, know what features of organizations vary and the parameters on which they vary, and be able to analyze, synthesize, and apply concepts to reduce organizational uncertainty, and to improve and regulate organization behaviors and outcomes. Attention will also focus on top down and participatory administration in organizations, and change in public, educational, and nonprofit organizations and agencies.
Restriction(s):
Can enroll if Class is Graduate

EDB 562  Labor Relat in School Settings  3 Credit Hours
The seminar will consider the impact of collective bargaining on traditional human resource administration in public, education, and nonprofit settings. It also will focus on developing an initial competency in the various activities associated with collective bargaining situations.
Prerequisite(s): PADM 560 or EDB 560
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDB 580  Info Sys and Stats for Admin  3 Credit Hours
This course will introduce Educational Administration students to descriptive and basic inferential statistics. Participants will use microcomputers and software to perform elementary statistical analyses, and to prepare presentation quality reports and graphics making use of statistical information.
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

EDB 581  Strategic Plng/Needs Assess  3 Credit Hours
This course develops the strategic planning and needs assessment competencies of participants. Emphasized in the course is the "cascade" process of information gathering involving interviewing, focus groups, and surveys as applied in strategic planning.
Restriction(s):
Can enroll if Class is Graduate

EDB 582  Policy Analysis & Development  3 Credit Hours
Policy formulation involves two different activities: 1) identifying and assessing alternative courses of action, i.e., deciding what, if anything, needs to be done about a problem; and 2) developing the policy, regulation or law that will carry an agreement in principle into effect. Both aspects of policy development will be covered in the course.
Restriction(s):
Can enroll if Class is Graduate

EDB 583  Program Evaluation  3 Credit Hours
This class will examine procedures for evaluating programs in public, education and nonprofit settings. The concern will be to examine the various techniques available to determine whether a program is doing what it was intended to do. Students will utilize various techniques in examining a variety of case situations.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Can enroll if Degree is Education Specialist, MA in Educational Leadership, Doctor of Education

EDB 586  Curriculum Delib and Develop  3 Credit Hours
Study of teaching, learning, evaluation, and outcomes of education in relation to curriculum study and development. Focus on policy issues, utilization of research and current effective practices related to the successful articulation and implementation of curricula.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDB 650  Assessment Seminar  1 to 3 Credit Hours
This class will focus on assessing the performance of individuals in administrative settings. There will be a variety of exercises which will provide an assessment of the students with regard to different administrative circumstances. Students will also evaluate their career plans and situation.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDB 700  Multicult Educ in U.S. Classrm  3 Credit Hours
The theoretical concepts from the history of education, educational research, and the social sciences will form a base for studying educational trends, issues, and reforms in our society of diverse origins and outlooks. Topics for discussion may include: issues in reform movements; social, economic, pedagogical, and ethical problems related to education; and problems and prospects in international educational competition. The focus will be on institutional problems and processes related to quality education for pupils in our multicultural society.
Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

EDB 701  Leadership and Administration  3 Credit Hours
Administration and supervision of elementary, middle, and secondary school entails the analysis of organizational arrangements at both the classroom and school level. This course will deal with applications and practices that develop competencies and behaviors that educators need to supervise, evaluate, and lead organizational and instructional improvement efforts for school, staff, and students.
Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

EDB 702  School and Community Relations  3 Credit Hours
Examines interactions of schools and their communities: citizens’ role/involvement in governance of education, internal and external communication concepts and practices, politics of education, community power and pressure groups, and organizational culture and climate.
Restriction(s):
Can enroll if Class is Specialist or Doctorate
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB 705</td>
<td>Intro to Educ Administration</td>
<td>3</td>
<td>This course will provide an overview of educational administration and cover basic issues facing school administrators. It provides an introduction to the role of the school leader in contemporary educational programs and services. Students will examine opportunities in school administration and begin to develop a knowledge base for leadership in a variety of educational settings.</td>
</tr>
<tr>
<td>EDB 720</td>
<td>Internship</td>
<td>1 to 3</td>
<td>Students who lack the necessary experience in responsible administration will be afforded the opportunity to gain the experience in an internship. The class and the number of hours will be arranged to fit the needs of the students as determined by the program coordinator.</td>
</tr>
<tr>
<td>EDB 721</td>
<td>Central Office Internship</td>
<td>2 to 3</td>
<td>Students who lack the necessary experience in central office administration will be afforded the opportunity to gain the experience in an internship. The class and the number of hours will be arranged to fit the needs of the students as determined by the program coordinator.</td>
</tr>
<tr>
<td>EDB 722</td>
<td>Seminar in Educ Leadership</td>
<td>3</td>
<td>This course provides an examination of the theoretical background, current practices and applications associated with transformational leadership and futures-oriented management in a variety of educational and nonprofit organizations. The course addressed leadership theory, application, and practices to develop competencies and behaviors required of organizational leaders to lead, supervise, implement, and evaluate performance and practices in a variety of organizational settings.</td>
</tr>
<tr>
<td>EDB 723</td>
<td>Legal &amp; Reg Issues in Educ</td>
<td>3</td>
<td>This class will focus on important legal and regulatory issues related to public, education, and nonprofit organizations. It will consider the various court and administrative decisions which affect these. Numerous case situations will be used to facilitate the student’s learning.</td>
</tr>
<tr>
<td>EDB 724</td>
<td>Superintendency</td>
<td>3</td>
<td>This course is designed to explore the role of the public school superintendent, the challenges and conflict of the position, and the educational, political, cultural, and social influences of the superintendent. The course examines the basic functions, duties, and responsibilities facing the modern superintendent, while effectively responding to instructional leadership needs, fiscal affairs, government legislation, labor relations, and evaluation and accountability of and by the superintendent.</td>
</tr>
<tr>
<td>EDB 725</td>
<td>Leadership Ethics</td>
<td>3</td>
<td>This course examines concepts and skills required by organizational leaders in ethical decision-making and professional behavior. The course will cover ethical issues that leaders encounter and will analyze means by which they can respond ethically and professionally to difficult situations. The course will explore strategies for influencing a culture of high ethical and professional standards within organizations.</td>
</tr>
<tr>
<td>EDB 740</td>
<td>School Budgeting &amp; Finance</td>
<td>3</td>
<td>Basic principles and actual practices of financial administration and accounting for state/local governments, public school systems, and nonprofit organizations, particularly budgeting and financial reporting within the context of other organizational processes and political demands and/or requirements. As one of the required seminars for the Educational Administration Certification, the case method will be employed to illustrate issues and problems of school financial administration.</td>
</tr>
<tr>
<td>EDB 750</td>
<td>Assessment Seminar</td>
<td>1 to 3</td>
<td>This class will focus on assessing the performance of individuals in administrative settings. There will be a variety of exercises which will provide an assessment of the students with regard to different administrative circumstances. Students will also evaluate their career plans and situation.</td>
</tr>
<tr>
<td>EDB 760</td>
<td>Admin of Human Resources</td>
<td>3</td>
<td>This seminar will examine human resource administration activities in public, educational and nonprofit settings. Issues such as recruiting, selection, planning, performance appraisal, contracting and collective bargaining will be related to the overall administrative activities. Emphasis will be placed on the connections between human resource issues in public, education, and nonprofit organizations.</td>
</tr>
<tr>
<td>EDB 762</td>
<td>Labor Rel in School Setting</td>
<td>3</td>
<td>The seminar will consider the impact of collective bargaining on traditional human resource administration in public, education, and nonprofit settings. It also will focus on developing an initial competency in the various activities associated with collective bargaining situations.</td>
</tr>
<tr>
<td>EDB 783</td>
<td>Program Evaluation</td>
<td>3</td>
<td>This class will examine procedures for evaluating programs in public, education, and nonprofit settings. The concern will be to examine the various techniques available to determine whether a program is doing what it was intended to do. Students will utilize various techniques in examining a variety of case situations.</td>
</tr>
<tr>
<td>EDB 786</td>
<td>Curriculum Delib and Develop</td>
<td>3</td>
<td>Study of teaching, learning, evaluation, and outcomes of education in relation to curriculum study and development. Focus on policy issues, utilization of research and current effective practices related to the successful articulation and implementation of curricula.</td>
</tr>
</tbody>
</table>
EDB 807  Strategic Comm for Admin  3 Credit Hours
This Internet course addresses three levels of administrative communications - individual, group and organization - and examines the concepts and skills needed to be an effective communicator. Students will develop applications emphasizing goal-oriented communications and making strategic choices in content, structure, style and delivery. An emphasis is given to the design and best use of computer technologies such as Word and PowerPoint applications. The course also covers basic ethical and legal issues of workplace communications.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDB 861  Organization Dev & Theory  3 Credit Hours
Students will learn how organizations are structured and shaped, know what features of organizations vary and the parameters on which they vary, and be able to analyze, synthesize, and apply concepts to reduce organizational uncertainty, and to improve and regulate organization behaviors and outcomes. Attention will also focus on top down and participatory administration in organizations, and change in public, educational, and nonprofit organizations and agencies.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDB 881  Strategic Plng/Needs Assess  3 Credit Hours
This course develops the strategic planning and needs assessment competencies of participants. Emphasized in the course is the “cascade” process of information gathering involving interviewing, focus groups, and surveys as applied in strategic planning.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDB 882  Policy Analysis & Development  3 Credit Hours
Policy formulation involves two different activities: 1) identifying and assessing alternative courses of action, i.e., deciding what, if anything, needs to be done about a problem; and 2) developing the policy, regulation or law that will carry an agreement in principle into effect. Both aspects of policy development will be covered in the course. (AY).

Restriction(s):
Can enroll if Class is Specialist or Doctorate

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Educ C-Psychological Foundatns (EDC)**

EDC 500  The Human Learner  2 Credit Hours
The growth and development of the human learner is studied, with stress upon teaching and learning from preschool through adulthood. Consideration will be given to theories of learning, development, and motivation, with the goal of identifying the implications of theory for educational practice.

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDC 501  Intro to Learning Disabilities  3 Credit Hours
Overview of characteristics, identification, service delivery models, and issues pertaining to persons from preschool to adulthood with learning disabilities. Required course for Special Education-Learning Disabilities Certification.

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDC 502  Adol Devl & Classroom Mgmt  3 Credit Hours
An examination of the current theories and research findings concerning the physical, social, emotional and cognitive development during the early and late adolescent years. Theory will be related to educational and parenting practices. Course includes significant material addressing classroom management of the middle school and high school classroom using simulations, case studies and videos of actual classrooms.

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDC 503  LD Practicum K-12  1 Credit Hour
The K-12 LD Practica will provide beginning students with initial exposure to the practical aspects of teaching LD students in a variety of general and special education settings. Students will be required to observe and actively participate in instructional planning, teaching, managing, and monitoring LD students in K-12 settings. Students will also observe a variety of service delivery models including the resource room, inclusive settings, and tutorial situations. Graduate standing or permission of the instructor; concurrent enrollment in C501.

Corequisite(s): EDC 501

EDC 504  Pract Adol Devl&Clsrm Mgmt  1 Credit Hour
A supervised field experience related to adolescent development and classroom management in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Must be taken with EDC 502. For undergraduate credit elect EDC 304.

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDC 505  Adult Lming:Theory & Practice  3 Credit Hours
This course introduces students to current theory and practice for understanding and working with adult learners in today's society.

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDC 506  Applied Behavior Analysis I  3 Credit Hours
This is the first in a two course sequence in applied behavior analysis (ABA) that focuses on the fundamental principles, processes, and concepts of the field. These principles, processes, and concepts serve as the foundation of practice. Topics include: the definition and characteristics of ABA, basic elements in a scientific analysis of behavior, principles and tactics for analyzing and changing behavior, and fundamental elements and key terms that are essential to understanding the relationship between behavior and its environment. (YR)
Prerequisite(s): EDC 506

EDC 507  Applied Behavior Analysis II  3 Credit Hours
This is the second in a two course sequence in applied behavior analysis (ABA) that focuses on the fundamental principles, processes, and concepts of the field that were covered in Applied Behavior Analysis I. Through discussion, demonstration, and analysis, students will learn about specific behavior change procedures based upon the principles of ABA and the process for selecting and implementing those procedures. (YR)

EDC 508  Intro to Devlpmntl Disabilities  3 Credit Hours
Full Title: Introduction to Developmental Disabilities This course will provide an overview of the issues related to individuals with developmental disabilities. Topics include the history, public policy issues, familial issues within the context of socio-cultural issues, and the role of families in the provision of services across the lifespan. Students will be exposed to the range of assessment practices for developmental disabilities and criteria for diagnosis. Other topics include educational and behavioral interventions, person centered planning/family centered support, post-school and adult issues, physical and mental health issues, services and supports to improve quality of life, controversies, therapies, and ethical issues. (YR)

EDC 511  Dev Peer/Social Relationships  2 Credit Hours
Students will examine the processes of peer relations and socio-emotional development from birth to adolescence. Topics to be covered in this course include attachment, peer popularity and intimacy. As well, students will discuss the importance of the family on social development. Classroom environment and peers as educators will also be covered. (OC)
Prerequisite(s): EDC 340*
Restriction(s):
Can enroll if Class is Graduate

EDC 512  Soc Devl & Pos Guidnce Techn  3 Credit Hours
This course will examine the process of social and emotional development in childhood through adolescence. Positive strategies to promote and guide this development in the classroom will be explored using behaviorist and constructivist frameworks. Topics will include character education, discipline models, conflict resolution and family collaboration. Guiding the development of emotional regulation, perspective taking and peer relationships in children including children with special needs will be investigated.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
Can enroll if College is Education, Health, and Human Services

EDC 514  Early Child Ed Special Needs  3 Credit Hours
Focuses on the psychological and educational needs of the young child with special needs. Discusses identification techniques and educational strategies for teaching in a regular early childhood classroom with young children having special needs. Special emphasis will be placed on behavioral, linguistic, and intellectual needs. Suitable for classroom teachers, child care directors, and teachers in training.
Prerequisite(s): EDC 540 or (EDC 340 or EDC 240 and (EDC 341) or EDC 241)
Restriction(s):
Can enroll if Class is Graduate

EDC 516  Research Methods Beh Analysis  3 Credit Hours
Full Title: Research Methods in Behavioral Analysis The purpose of this course is to introduce the fundamentals of behavior-analytic research methods. The course will review single-case time series methodologies to assess various dimensions of behavior and evaluate the effects of interventions on behavior. Single-case research has played an important role in developing and evaluating interventions designed to modify some aspect of human behavior. This course will encompass a broad range of research areas that utilize single-case designs within both the behavior analytic literature and other disciplines including school psychology, medicine, and business. (YR)
Prerequisite(s): EDC 506*

EDC 517  Mgmt of Classroom Behavior  3 Credit Hours
Provides intervention and management techniques for teachers and teacher candidates using principles of behavior modification. Includes examination of theoretical foundations, research and field reports, participation in self-management projects, and consideration of various applications in regular and special classrooms. Field experience is optional. Will focus on classroom management in early childhood and elementary environments, allowing a more focused examination of topics and case studies geared to those grade levels.
Prerequisite(s): EDC 300

EDC 520  Hum Sexuality:Psyc-Ed Concepts  2 Credit Hours
The course is intended to acquaint elementary and secondary teachers with the elements that comprise sexuality as it relates to their lives and those of their students. Although a basic core of information is to be covered, the content of each class will provide for the needs and interests of the teachers. Teachers will be directly involved in identifying problems and the development and collection of strategies for problem resolution. Teachers who complete this program will meet the state requirements for certification in sex education/reproductive health.

EDC 525  TREAT Plan/Eth Prof Cond ABA  3 Credit Hours
Full Title: Treatment Planning/Ethical and Professional Conduct in Applied Behavior Analysis. This course provides a comprehensive approach to treatment planning in Applied Behavior Analysis. The course addresses application of the principles of Applied Behavior Analysis to intervention, assessment, implementation, evaluation, program continuation/maintenance, and data-based clinical decision making. Central to treatment are the ethical responsibilities for Applied Behavior Analysts. The Professional and Ethical Compliance Code for Behavior Analysts, as put forth by the Behavior Analyst Certification Board is addressed. Throughout the course, the behavior analytic literature is used as the basis for all coursework, discussion, and evaluation. (YR)
Prerequisite(s): EDC 506
EDC 531 Constructivist Education 3 Credit Hours
An examination of constructivist theory and its application to educational practices. The nature and stages from birth through adolescence of cognitive and social development from the constructivist viewpoints of Piaget, Vygotsky, and others will be discussed. A major focus will be the application of constructivist theory to educational goals, teaching strategies and curriculum.
Prerequisite(s): (EDC 340 or EDC 240) and (EDC 341 or EDC 241)
Restriction(s):
Can enroll if Class is Graduate

EDC 539 Child Maltreatment and Trauma 3 Credit Hours
This course will examine adverse childhood experiences, including the impact of physical abuse, neglect, sexual abuse, and other forms of psychological trauma. Particular emphasis will be placed on the role of trauma informed professionals to identify, assess, and support the needs children, youth, and families impacted by trauma and child maltreatment. This course will explore various levels of prevention, intervention, and collaborative response to suspected cases of child maltreatment by multi-disciplinary teams, including investigation and treatment. (YR)
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

EDC 540 Advanced Child Development 3 Credit Hours
An advanced study of the development of the child from conception through adolescence. Research on physical, cognitive, and psychosocial development will be explored and analyzed. Current applications of knowledge in this field will be examined as well as new innovations in both research and practice.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDC 541 The Child: Birth to Three 2 to 3 Credit Hours
An examination of current theories and findings concerning the physical, social, emotional and intellectual development of the young child from prenatal to three years of age. Topics include fetus maturation, capabilities of the newborn, language, cognition, and environmental influences on development. Theory will be related to infant care practices in the home and in early childhood centers.

EDC 542 EC:Fam/Sch/Com Collab Mult Soc 3 Credit Hours
FULL COURSE TITLE: Early Childhood: Family School Community Collaboration in a Multicultural Society. Focuses on factors which influence the building of partnerships among early childhood professionals, families and communities. Includes understanding and working with culturally and linguistically diverse families. Various communication and problem-solving strategies which promote family involvement and community outreach are practiced through discussion and role play.
Prerequisite(s): (EDC 340 or EDC 240) and (EDC 341 or EDC 241)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDC 543 Family/School/Community Collab 2 Credit Hours
Characteristics, roles, and functions of contemporary families are described. Various communication and training strategies designed to promote collaboration and teamwork within and between the school staff, the families, and community are described and practiced through discussion, problem-solving activities, and role playing. Family effectiveness assessment instruments and strategies are also described and practiced.
Restriction(s):
Can enroll if Class is Graduate

EDC 545 Develop Assess of Young Child 3 Credit Hours
Survey and demonstrations of formal and informal measures to assess young children's physical, social, intellectual, and emotional development. Instruction in some techniques appropriate for use by classroom teachers, childcare directors, health care professionals, and others who are interested in assessing the development of children aged birth to nine years. Students cannot receive credit for both EDC 545 and EDC 445.
Prerequisite(s): EDC 340 or EDC 240
Restriction(s):
Can enroll if Class is Graduate

EDC 546 Cog/Memory Dev in Children 3 Credit Hours
Examines the theories and recent research on the development of cognition and memory. Selected topics include: perception, language, representation, social cognition and problem solving. Educational implications and strategies for developing children's thinking and memory are explored.
Prerequisite(s): EDC 340 or EDC 540
Restriction(s):
Can enroll if Class is Graduate

EDC 549 Develop Assess of Young Child 2 to 3 Credit Hours
Survey and demonstrations of formal and informal measures to assess young children's physical, social, intellectual, and emotional development. Instruction in some techniques appropriate for use by classroom teachers, childcare directors, health care professionals, and others who are interested in assessing the development of children aged birth to nine years. Students cannot receive credit for both EDC 545 and EDC 445.
Prerequisite(s): EDC 340 or EDC 240
Restriction(s):
Can enroll if Class is Graduate

EDC 550 Advanced Child Development 3 Credit Hours
Examine the theories and recent research on the development of cognition and memory. Selected topics include: perception, language, representation, social cognition and problem solving. Educational implications and strategies for developing children's thinking and memory are explored.
Prerequisite(s): EDC 340 or EDC 540
Restriction(s):
Can enroll if Class is Graduate

EDC 551 The Child: Birth to Three 2 to 3 Credit Hours
An examination of current theories and findings concerning the physical, social, emotional and intellectual development of the young child from prenatal to three years of age. Topics include fetus maturation, capabilities of the newborn, language, cognition, and environmental influences on development. Theory will be related to infant care practices in the home and in early childhood centers.

EDC 554 Formal & Informal Testing&Eval 2 to 3 Credit Hours
In this course students will develop their knowledge and skills in traditional and non-traditional methods for evaluating classroom learning, performance technology and training. Students will learn how to construct evaluations, tests, analyze evaluation results, conduct program evaluation and educational assessment in relation to performance technology, training and teaching and learning.
Restriction(s):
Can enroll if Class is Graduate

EDC 555 Assmt: Sec Lang Learning K-12 2 Credit Hours
In this course, students will learn to identify, assess, and place second language learners for appropriate instruction and instructional programs. Students will review, evaluate, and implement a variety of assessment instruments and strategies intended for use with limited English proficient students, K-12. Students will also examine the impact and issues regarding high-stakes assessments on English language learners. Official admission to and good standing in the teacher certification program are required. (W).
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDC 556 Learning & Classrm Assessment 3 Credit Hours
In this course students will examine the relationship between curriculum, instruction and assessment. Students will review different forms of assessment and evaluate the strengths and weaknesses of each format. Students gain experience in 1) selection of assessment formats based on curricular focus and student developmental levels; 2) development of assessments; and 3) decision-making based on the results of the assessments.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCDF or Graduate
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services
EDC 560  Rdg:Diag/Assessment Tech K-12  3 Credit Hours
Overview of K-12 reading diagnostic and assessment techniques. Review of state-mandated tests. Use of criterion referenced tests, norm-referenced tests, and informal inventories to develop individual reading profile. Results of diagnostic instruments will be interpreted to suggest appropriate instructional strategies. (YR).
Restriction(s):
Can enroll if Class is Graduate

EDC 561  Educating the Exceptional Child  3 Credit Hours
Characteristics, identification, assessment and instruction of students with exceptionalities are addressed. Includes students with learning disabilities, behavior disorders, emotional impairment, mild mental retardation, communicative disorders, visual and hearing impairments, orthopedic impairments, giftedness, and chronic medical conditions. Service delivery models, general assessment procedures, and curricular and instructional adaptations that help integrate students with exceptionalities into the general education classroom will also be addressed.
Restriction(s):
Can enroll if Class is Graduate

EDC 580  Behavioral Assessment  3 Credit Hours
This course will focus on Functional Behavior Assessment, a process used in the field of Applied Behavior Analysis (ABA) that uses a variety of techniques and strategies to gather information that allow practitioners to identify the function, or purpose, of behavior. Essential elements of the Functional Behavior Assessment/Functional Analysis process will be addressed with emphasis on the interrelationship between assessment results and the development of interventions based upon the principles of ABA. (YR)
Prerequisite(s): EDC 506 and EDC 507

EDC 590  Litrcy Instr & Assess for Els  3 Credit Hours
Full Title: Literacy Instruction and Assessment for English Language Learners. The course covers current and research-based pedagogy for literacy instruction and assessment for teaching English language learners. This course provides the knowledge and skills to effectively teach literacy to non-native speakers of English. (YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate

EDC 603  Mntl Hlth in Med, Hu Srv, Lrn  3 Credit Hours
Full Title: Mental Health Issues in Medical, Human Services, & Learning Environments. This course surveys mental health across the lifespan and the manifestation of mental health issues in medical, human services, and educational environments. Included are developmental factors, diagnostic issues, theoretical formulations, etiology, commonly used evidence-based treatments, and research findings related to the range of mental health issues. Issues related to classification systems, diagnosis, and institutional responses to mental health issues within the context of medical, human services, and learning environments are also addressed. Medical, legal, educational, and social-emotional issues related to mental health and the treatment of people living with mental health issues are addressed. Other issues such as comorbidity, cultural influences on the expression of mental health, and psychological factors related to physical conditions will also be considered. (OC)

EDC 604  Adverse Childhood Experiences  3 Credit Hours
Full Course Title: Adverse Childhood Experiences Adverse Childhood Experiences (ACEs) are stressful, traumatic events, e.g., physical, sexual, or emotional abuse, neglect, multiple foster care placements, exposure to community violence, or significant family dysfunction (e.g., exposure to domestic violence, inconsistent caregiving due to mental illness or substance abuse)), that have cognitive, affective, behavioral, and physiological impact across the lifespan. This course will examine the ACEs, their impact on one’s overall functioning, and the implications for one’s physical health, academic performance, and social-emotional functioning. Strategies and tools for interacting and communicating with individuals with ACEs are addressed, along with treatment modalities, ACE prevention strategies, and educational, clinical, and community resources. (OC)

EDC 616  Needs Assessment  3 Credit Hours
Full Title: Needs Assessment Evaluation Capstone This course is designed to provide students with the theoretical and practical knowledge to design, complete and report a needs assessment evaluation for an organization. A culminating assignment requires the students to integrate the knowledge and skills they have developed over the course of their graduate studies in a capstone project. (YR)

EDC 620  Survey Research and Design  3 Credit Hours
This course provides an advanced focus on the theories, methods, and procedures for conducting survey research in education. Topics explored include advanced design of survey instruments, interview and focus group protocols, planning and budgeting survey research, and survey data analysis techniques. Sampling and mixed method design will be addressed.
Prerequisite(s): EDC 500 and EDC 556
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

EDC 622  Science and Human Behavior  3 Credit Hours
The philosophy of the science of behavior is the foundation of applied behavior analysis (ABA), learning that philosophy is key to the application of the fundamental principles, processes, and concepts of the field. This course will address seminal publications in the science of behavior and examine their application. (YR)

EDC 623  Ethics in ABA  3 Credit Hours
This course provides students pursuing the BCBA certification with a comprehensive examination of the Professional and Ethical Compliance Code for Behavior Analysts. Through reading and discussion of the code, students will learn to recognize Code violations and avoid unethical behavior and Code violations in all aspects of practice. Throughout the course, case studies will be used as a basis for demonstrating Code violations. (YR)
Prerequisite(s): EDC 506

EDC 624  Prog Develop, Super & Mgmt  3 Credit Hours
Full Title: Program Development, Supervision & Management This course seeks to address the selection, development, and implementation of behavior change procedures within the framework of strategies for personnel training, supervision, and management. Through the sue of case studies, students will develop behavioral programming, consider the personnel issues to consider for effective programming, and examine strategies that allow for more effective personnel training, monitoring, and supervision. (YR)
Prerequisite(s): EDC 506 and EDC 507
EDC 630  Portfolio and Performance  3 Credit Hours
This course in an introduction to the theory and practice of performance and portfolio assessment. It examines the theory behind both forms of assessment including issues of validity, scoring, and the relationship to standards-based objectives. Topics include portfolio types, structures, contents and uses, as well as visual, written, oral, electronic and performance assessment. Students will create both a performance and a portfolio task, associated rubrics, and gain an understanding of how these types of assessments can impact teaching and learning.

Prerequisite(s): EDK 500 and EDC 556
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if College is Education, Health, and Human Services

EDC 645  Transdisc Appr: Assess/Collab  3 Credit Hours
Culturally sensitive and family-centered approaches to assessing infants, toddlers, and young children with a variety of disabilities as well as determining family resources, needs and priorities will be the focus. Selecting and using assessment instruments and procedures in order to guide decision-making about determining eligibility for services, planning intervention goals and objectives, monitoring progress, and evaluating program effectiveness will be included. (YR).

Prerequisite(s): EDC 414 or EDC 514
Restriction(s):
Can enroll if Class is Graduate

EDC 701  Intro to Learning Disabilities  3 Credit Hours
Overview of characteristics, identification, service delivery models, and issues pertaining to persons from preschool to adulthood with learning disabilities. Required course for Special Education-Learning Disabilities Certification.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDC 714  Early Child Ed Special Needs  3 Credit Hours
Focuses on the psychological and educational needs of the young child with special needs. Discusses identification techniques and educational strategies for teaching in a regular early childhood classroom with young children having special needs. Special emphasis will be placed on behavioral, linguistic, and intellectual needs. Suitable for classroom teachers, child care directors, and teachers in training.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDC 731  Constructivist Education  3 Credit Hours
An examination of constructivist theory and its application to educational practices. The nature and stages from birth through adolescence of cognitive and social development from the constructivist viewpoints of Piaget, Vygotsky, and others will be discussed. A major focus will be the application of constructivist theory to educational goals, teaching strategies and curriculum. Additional course work differentiates this course from the master's level course.

Restriction(s):
Can enroll if Level is Specialist or Doctorate or

EDC 740  Seminar in Ed Psych/Spec Educ  3 Credit Hours
This course will focus on contemporary topics related to the development of knowledge of current theories in the areas of cognitive development, language, motor, and social development, in particular as they relate to issues in special education.

Restriction(s):
Cannot enroll if Class is
Can enroll if Degree is Education Specialist, Doctor of Education
Can enroll if College is Education, Health, and Human Services

EDC 756  Learning & Classrm Assessment  3 Credit Hours
In this course students will examine the relationship between curriculum, instruction and assessment. Students will review different forms of assessment and evaluate the strengths and weaknesses of each format. Students gain experience in 1) selection of assessment formats based on curricular focus and student developmental levels; 2) development of assessments; and 3) decision-making based on the results of the assessments.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDC 845  Transdisc Appr: Assess/Collab  3 Credit Hours
Culturally sensitive and family-centered approaches to assessing infants, toddlers, and young children with a variety of disabilities as well as determining family resources, needs and priorities will be the focus. Selecting and using assessment instruments and procedures in order to guide decision-making about determining eligibility for services, planning intervention goals and objectives, monitoring progress, and evaluating program effectiveness will be included. (YR).

Prerequisite(s): EDC 545
Restriction(s):
Can enroll if Class is Specialist or Doctorate

Other Content
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

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Educ D-Curriculum & Instructn (EDD)

EDD 501  Teach English in Second Grds  3 Credit Hours
Investigates the general and specific goals and objectives of English education. Trends, materials, and strategies are presented. A study of outstanding problems in the teaching of English composition, literature, grammar, and language are discussed. Official admission to and good standing in teacher certification program are required.

Restriction(s):
Can enroll if Class is Graduate

EDD 502  Practicum: English Second Grd  1 Credit Hour
A supervised field experience related to the teaching of English in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Must be taken concurrently with EDD 501. For undergraduate credit elect EDD 441.
Corequisite(s): EDD 501
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services
EDD 503 Wksp: Art in the Elementary Sch  2 Credit Hours
A course which presents the rationale, trends, and principles of art education for elementary teachers. Teachers will have ample opportunities to experiment with various art media such as printmaking, papercrafts, paints, and clay. Different strategies that focus on the creative growth of children will be developed. (OC)
Restriction(s):
Can enroll if Class is Graduate

EDD 504 Inquiry Based Curr Prim Grades  3 Credit Hours
This course examines how teachers can apply inquiry method to all curriculum areas in the primary grades. Major focus will be designing curriculum to meet state and professional guidelines within a developmentally appropriate context.
Prerequisite(s): (EDC 340 and EDC 341) or (EDC 240 and EDC 241)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

EDD 508 Practicum in Early Child Ed  1 Credit Hour
A supervised field experience related to the study of early childhood education involving a minimum of 45 clock hours of observation and work spread over a semester in an early childhood school setting. TB clearance, physician's statement of good health, and criminal background check are required. Students cannot receive credit for both EDD 410 and EDD 508. (F,W)
Restriction(s):
Can enroll if Class is Graduate

EDD 509 Workshop in Secnd Sci Educ  1 to 6 Credit Hours
Provides an opportunity for experienced professionals in junior and senior high schools to work on problems and topics related to the teaching of natural science.
Restriction(s):
Can enroll if Class is Graduate

EDD 513 Internship Elementary LD  2 or 3 Credit Hours
Field experience with elementary students with learning disabilities in regular and resource classrooms. Experiences include delivery of direct instruction through observation, tutoring, small and large group instruction, and small and large group assessment, curriculum development, participation in the IEP process, collaboration with regular classroom teachers, and other activities under the on-site supervision of a certified teacher of LD and LD-certified university field supervisor.
Prerequisite(s): EDC 501 and EDN 501 and EDN 503 and EDN 504
Corequisite(s): EDN 508
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDD 515 Internship - Secondary LD  2 Credit Hours
Field experience with secondary students with learning disabilities in secondary-general and special education classrooms. Experiences include delivery of direct instruction through observation, tutoring, small and large group instruction, curriculum development and adaptations for secondary settings, participation in the IEP and ITP process, collaboration and co-teaching with regular classroom teachers in various academic content areas, and other activities under the on-site supervision of a certified teacher of LD and LD certified university field supervisor.
Prerequisite(s): EDC 501 and EDN 501 and EDN 503 and EDN 504
Corequisite(s): EDN 508

EDD 516 Creativity/Crit Thnk Yng Chldr  3 Credit Hours
This course intends to study the processes and products of creativity for both adults and young children. Strategies for promoting the emerging creative disposition of the young child, birth to eight years, will be explored. Areas of focus will include art, music, movement, dramatic play, improvisation, storytelling, and problem-solving. The importance of understanding and encouraging the young child's capacity for representation skills will be emphasized.
Prerequisite(s): EDC 340
Restriction(s):
Can enroll if Class is Graduate

EDD 517 Sem: Teaching Secondary MAT  1 Credit Hour
Draws upon the resources found in the directed teaching environment. Considers problems and issues in four broad areas: students in the school, teacher's professional responsibilities, curriculum understandings, and administrative/organizational problems. Open only to students enrolled in EDD 518.
Corequisite(s): EDD 518
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services
Can enroll if Program is MAT-Teaching

EDD 518 Directed Tchg (MAT) Second Sch  7 to 12 Credit Hours
Directed teaching consists of a teaching internship in a selected classroom for a full term under the direction of an experienced teacher. Includes a period of observation followed by several weeks of responsible teaching. (F, W).
Prerequisite(s): EDA 500 and EDB 500 and EDC 502 and EDC 561 and EDC 554 and EDC 517 and EDT 511 and EDD 569
Corequisite(s): EDD 517
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services
Can enroll if Major is Teaching

EDD 519 Early Literacy/Language Develp  3 Credit Hours
This course examines early language development, the factors that contribute to its growth and the role that it plays in the development of literacy. Diagnostic techniques for assessing language and literacy and teaching strategies and materials to facilitate language and literacy growth in children birth through third grade will be discussed. (YR)
Prerequisite(s): EDC 340
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Education, Health, and Human Services

EDD 530 Concepts & Strat/Tchg/Mdl Lev  3 Credit Hours
FULL TITLE: Concepts and Strategies for Teaching at the Middle Level. Introduces current curricular trends and various teaching strategies for use at the middle school level to stimulate inquiry in the classroom. Opportunity will be provided to experiment with these strategies in videotaped, microteaching situations.
Restriction(s):
Can enroll if Class is Graduate
EDD 534  ML Curriculum & Instruction  3 Credit Hours
This course addresses curriculum development and instruction adapted to meet the unique needs and characteristics of the middle level student. Attention is given to instructional planning, presentation, and assessment of learning.
Corequisite(s): EDD 535
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 535  Field Exploration: ML  1 Credit Hour
Field exploration involving a minimum of 45 clock hours research activities related to the study of middle level curriculum development, instruction and students.
Corequisite(s): EDD 534
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 536  Grad Sem in Early Childhood Ed  3 Credit Hours
This course examines the theories, research, and educational practices developmentally appropriate for children: infancy through primary grades. The seminar provides the theoretical foundation for the field placement (EDD 594). Strategies for planning effective curricular activities, arranging a learning environment, communicating and working with families and staff, and administering early childhood programs will be discussed. The issues of multiculturalism, family centered approaches, addressing the inclusion of children with special needs and professional development will be addressed. Open only to graduate students seeking an early childhood endorsement and approved by the program coordinator. TB test, physician’s statement of good health, and criminal background check are required. (W).
Prerequisite(s): EDC 540
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development
Can enroll if Degree is Master of Arts

EDD 537  Administrative Intern in EC  3 Credit Hours
This internship will focus on providing experience in central early childhood office administration. Recruitment, communication skills, financial administration, grant writing, leadership, program evaluation and program development and other topics related to the administration of Early Childhood programs will be developed and practiced. This course studies the procedures for evaluating early childhood programs and for continual program development in their leadership.
Prerequisite(s): EDD 412 or EDD 536
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Education, Health, and Human Services

EDD 542  Differentiating Inst K-12 Clrm  2 to 3 Credit Hours
Individualized instruction combined with the latest information on the brain and our understanding of multiple intelligences leads us to a new method of meeting the needs of students called differentiating instruction. This course will look at the concept of differentiating instruction in-depth.

EDD 543  Tchg Writing at the Scnd Lvl  2 to 3 Credit Hours
This course is designed to help the classroom teacher promote functional and creative writing among students at the secondary school level. Attention will be given to both theory and research with emphasis on the development of instructional strategies, teaching materials and practical resources.
Restriction(s):
Can enroll if Class is Graduate

EDD 546  Intervention Strat EC Spec Ed  3 Credit Hours
Course Title: Family-Centered Intervention Strategies for Early Intervention and Early Childhood Special Education. Strategies and methods which early educators can use when planning and implementing interventions for infants, toddlers and young children with disabilities and their families. Emphasis will be on addressing family identified priorities and the goals and objectives stated on the Individual Family Service Plan (IFSP) or Individual Educational Plan (IEP) using activity-based intervention, adapting materials, modifying environments and using assistive technology. (W, YR)
Prerequisite(s): EDC 514 and EDC 540
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Can enroll if College is Education, Health, and Human Services

EDD 547  Tchng English as Second Lang  3 Credit Hours
This course examines current methodologies and theories for English as a second language learning and instruction. Emphasis will be placed on a standards-based curriculum for English language learners. The use of communicative activities and strategies for developing English language skills in the elementary grades will be emphasized. Official admission to and good standing in teacher certification program are required. (F).
Prerequisite(s): EDC 540
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDD 548  Pract: Tch English as Secnd Lang  1 Credit Hour
A supervised field experience related to the teaching of English as a second language. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Must be taken concurrently with EDD 547. For undergraduate credit elect EDD 448. (F).
Prerequisite(s): EDD 547
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EDD 552  Methods of Teaching Math K-8  3 Credit Hours
The course relates to the teaching of the mathematics curriculum in the elementary and middle school. The emphasis is on the development of teaching techniques that promote problem solving, reasoning, connections, communication, and concept and algorithmic development. Cooperative groups, manipulatives, technology, and meeting the special needs of every child in grades K-8. Required for all preservice elementary teachers. Official admission to and good standing in teacher education program required.
Prerequisite(s): MATH 387
Restriction(s):
Can enroll if Class is Graduate
EDD 554  Wrkshp:Newspaper in Educ  2 Credit Hours
A course designed to familiarize elementary and secondary teachers with
the use of newspapers as a classroom resource. Workshop participants
will use the daily newspaper and other resource materials to develop
activities appropriate for meeting their own professional needs. Emphasis
will be on the enhancement of academic skills, practical life skills and
creative expression.
Restriction(s):
Can enroll if Class is Graduate

EDD 560  Reading/Clinical Pract Int/Sem  3 Credit Hours
A supervised field experience in which students will work in a reading
program. In this internship students will acquire experience in selecting
students for the program, assessing students, working with students to
develop reading and writing skills, and in reporting functions. In addition,
a weekly seminar to explore issues related to reading programs will be
held. (S)
Prerequisite(s): EDA 519 and EDB 503 and EDC 560
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Degree is Master of Arts
Can enroll if College is Education, Health, and Human Services
Can enroll if Program is MA-Education

EDD 563  Tchg Giftd Stndnt Reglr Clssr  2 Credit Hours
This course introduces classroom teachers to the education of gifted
and talented students in the regular classroom. It is designed to help
teachers understand the social, emotional, and intellectual needs
of gifted students and to show them ways of effectively addressing
these needs along with those of the other students present. It will offer
specific proposals for structuring the learning environment as well as for
selecting appropriate levels and types of subject matter.
Restriction(s):
Can enroll if Class is Graduate

EDD 565  Teach Math in Second Grades  2 to 3 Credit Hours
This course discusses: 1) the important parts of recent pedagogical
literature, 2) new instructional materials, methods, and curricular trends,
and 3) procedures useful in the construction of new units and in the
improvement of curricular units. Official admission to and good standing
in teacher certification program are required.
Prerequisite(s): MATH 412 and MATH 331
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 566  Practicum: Math Second School  1 Credit Hour
A supervised field experience related to the teaching of mathematics in
grades 6-12. Requires a minimum of 45 clock hours of observation and
work in a school setting. Must be taken concurrently with EDD 565. For
undergraduate credit elect EDD 451.
Corequisite(s): EDD 565
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 567  Practicum in Reading Instruct  1 Credit Hour
A required supervised field experience related to the teaching of reading
in the elementary and/or K-8. Involves a minimum of 45 clock hours of
work and observation in a supervised classroom setting. Techniques
learned in EDD 568 will be applied directly to increase the reading
competence of elementary school children. Must be elected concurrently
with EDD 568. TB test and criminal background check required.
Corequisite(s): EDD 568
Restriction(s):
Can enroll if Class is Graduate

EDD 568  Teach Read/Lang Arts- Elem Grd  3 Credit Hours
Acquaints the student with theory, methods, materials, and research
related to the teaching of reading and other communications skills in
the elementary and/or K-8. Includes classroom activities designed to
strengthen skills in reading comprehension, word recognition, word
attack, and the related language arts. Official admission to and good
standing in the College of Education, Health, and Human Services
certification program are required. Students cannot receive credit for both
EDD 469 and EDD 569.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 569  Reading in the Content Areas  3 Credit Hours
Emphasis on developmental and remedial reading activities at the middle
grades and the secondary level; diagnosis, testing, and materials; reading
in the content subjects; study habits; independent reading activity;
exemplary programs. Some attention will be given to related problems
in the teaching of written composition. Official admission to and good
standing in the College of Education, Health, and Human Services
certification program are required. Students cannot receive credit for both
EDD 469 and EDD 569.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 571  Reading Instr: Models and Meth  2 to 3 Credit Hours
The impact of psycholinguistic research on reading instruction will be
examined especially as it relates to: reading comprehension, the
teaching of phonetic skills, the teaching of reading/study skills in content
areas, and in testing. Various approaches to reading instruction will be
reviewed. Students electing this course for three credit hours will be
required to complete a reading tutorial suitable in meeting the needs of
an elementary student. Not open to students who have taken EDD 472,
EDD 532, or EDD 570. Official admission to and good standing in the
College of Education, Health, and Human Services certification program
are required.
Restriction(s):
Can enroll if Class is Graduate

EDD 574  Environmental Education  2 to 3 Credit Hours
An analysis of environmental education at both the elementary and
secondary school level particularly stressing the environment as a
teaching resource. Community resources as they relate to environmental
education also are investigated.
Restriction(s):
Can enroll if Class is Graduate
EDD 575  Integrating Science & Literacy  3 Credit Hours
Students will enhance their understanding of and ability to integrate multiple literacy skills into the science classroom. Students will create integrated classroom activities and lessons based on State of Michigan benchmarks in language arts and science. (F,W).
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 580  Teach of Sci in the Second Grd  2 to 3 Credit Hours
A survey of the place of science in the secondary school curriculum, an analysis and evaluation of objectives, and a consideration of modern practices in teaching science. Official admission to and good standing in teacher certification program are required.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 581  Practicum in Science:Secnd Grd  1 Credit Hour
A supervised field experience related to the teaching of science in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Must be taken concurrently with EDD 580. For undergraduate credit elect EDD 481.
Corequisite(s): EDD 580
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 582  Tch Sci in Secondary Grds II  3 Credit Hours
This course builds upon the concepts and skills developed in EDD 480 as students learn to become effective, reflective science teachers. Students will learn multiple strategies for effective lesson planning, teaching, and assessment in science. Science, technology, engineering and mathematics (STEM) and integration of reading/writing strategies will be emphasized throughout the course. Students cannot receive credit for both EDD 482 and EDD 582. EDD 582 will be distinguished from EDD 482 by additional readings and assignments for the enrolled students.
Prerequisite(s): EDD 480 and EDD 481
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 583  Wkshp:Sci Teach Elem/Midd Schl  1 to 3 Credit Hours
Deals with existing and innovative science materials. Offered at various times emphasizing one or more areas from elementary and middle level science. Centers on a laboratory approach. May be elected twice for a total of six hours.
Restriction(s):
Can enroll if Class is Graduate

EDD 585  Teach Science in the Elem Grd  2 to 3 Credit Hours
Explores the objectives, methods, and instructional emphasis of elementary school science. Stresses concept development in several areas of elementary science. Provides opportunity for preparation of materials for classroom use. Official admission to and good standing in teacher certification program are required. Students cannot receive credit for both EDD 485 and EDD 585.

EDD 586  Environmental Interpretation  3 Credit Hours
Course deals with the interpretation of the environment, its characteristics, and its presentation to school groups as well as to the general public. Intended to acquaint students with a variety of skills and techniques necessary for interpreting the environment to others. Extensive use is made of the UM-D Environmental Study Area.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

EDD 589  Practicum in Soc Stud:Sec Sch  1 Credit Hour
A supervised field experience related to the teaching of social studies in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Must be taken concurrently with EDD 590. For undergraduate credit elect EDD 489.
Corequisite(s): EDD 590
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 590  Tch of the Soc Stud in Sec Sch  2 to 3 Credit Hours
This course examines theoretical and practical approaches to teaching social studies at the secondary level. Students explore, develop, and evaluate instructional methods. In light of professional standards, they consider diverse strategies for teaching and assessing middle and high school students.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 593  Simulation and Gaming  1 to 3 Credit Hours
This course focuses on simulation and gaming as approaches to learning which are fundamentally different from methods traditionally used in education, industry, business, and psychology. Students will have the opportunity to examine many different types of simulations and games and to participate in selected ones. They will also be able to design one for use in their own area of interest.
Restriction(s):
Can enroll if Class is Graduate

EDD 594  Early Childhood Ed Internship  2 to 3 Credit Hours
Supervised observation and teaching in early childhood programs under the joint direction of university and school personnel. Open only to students in the M.A. in Education Program (Early Childhood Endorsement) who have been approved for the course by the program director. TB clearance, physician’s statement of good health, and criminal background check required. Replaces EDD 494 as the graduate level Early Childhood Internship.
Prerequisite(s): EDD 536
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services
Can enroll if Major is Early Childhood
EDD 595  Wkshp: Social Studies Educ  2 to 3 Credit Hours
The workshop is planned to acquaint elementary and secondary teachers with specific trends and/or problems in social studies education. The theme of each workshop will vary according to the needs and interests of the teachers to reflect current interests in social studies education. Teachers will be directly involved in problem definition, literature review, research, and the collection and creation of strategies for classroom use. Students may repeat the course as topics vary up to a maximum of three hours of credit.
Restriction(s):
Can enroll if Class is Graduate

EDD 596  Second Lang Tchg: Sec Level  3 Credit Hours
An examination of current methodologies and techniques for instruction in foreign languages in grades 7-12. Emphasis will be placed on a standards-based curriculum with special attention given to the creation of learning scenarios. The use of communicative activities and the assessment of language skill areas will also be emphasized. Official admission to and good standing in teacher certification program are required.
Prerequisite(s): FREN 301 or GER 301 or SPAN 301
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 597  Practicum in Second Lang Tchg  1 Credit Hour
A supervised field experience related to the teaching of a foreign language in grades 6-12. Requires a minimum of 45 clock hours of observation and work spread over a semester in a school setting. Official admission to and good standing in teacher certification program are required. Must be taken concurrently with EDD 596. For undergraduate credit elect EDD 497.
Prerequisite(s): FREN 301 or GER 301 or SPAN 301
Corequisite(s): EDD 596
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 598  Writing Meth: Formal&Informal  3 Credit Hours
This course is designed for those wishing to establish or improve creative writing programs in their elementary school classrooms. Theoretical models will be discussed. Strategies and materials which facilitate the writing of prose and poetry will be emphasized. (OC)
Restriction(s):
Can enroll if Class is Graduate

EDD 599  Social Studies in the Elemt Grd  2 to 3 Credit Hours
Examination and analysis of various programs and materials currently available for teaching social studies at the elementary level. Critical investigation of new developments and trends. Opportunity is provided to experiment with various techniques and to evaluate their effectiveness. Official admission to and good standing in teacher certification program are required.
Restriction(s):
Can enroll if Class is Graduate

EDD 631  Junior High/Middle Sch Currcml  2 Credit Hours
Relates the junior high and middle school curriculum to the unique needs and characteristics of early adolescence. Gives attention to the scope, organization, and interrelationships of instructional programs as well as trends, experimentation, innovations and reports of research in this field. Designed for pre-service and in-service teachers.
Restriction(s):
Can enroll if Class is Graduate

EDD 650  Internship ECSE  1 to 3 Credit Hours
Supervised observation and teaching in Early Childhood Special Education setting under the joint direction of university and program personnel. Open only to graduate students in the Early Childhood Special Education Inclusion program who have been approved for the course by the program director. (YR).
Prerequisite(s): EDC 645 and EDD 546
Corequisite(s): EDD 651
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 651  Seminar in ECSE  1 Credit Hour
The seminar provides a theoretical foundation and support for the Internship in Early Childhood Special Education. Focus is on understanding the supports and barriers to implementing recommended practices in early childhood special education and early intervention as well as the changing roles of professionals working in early care and education settings. Skills in family-centered service delivery, collaborative consultation, problem-solving, teaming, advocacy and supervising paraprofessionals will be included. (YR).
Prerequisite(s): EDC 645 and EDD 546
Corequisite(s): EDD 650
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDD 680  Adv Science Meth: Secondary  3 Credit Hours
This course is designed for students interested in utilizing the research in science education at the secondary level. Students will study historical and philosophical perspectives that have shaped thinking and research related to science education. They will also be involved in the latest methods and techniques for science teaching and learning. Topics will include the use of inquiry methodologies, science education research, integration of science and other core subject areas, and current science education reform efforts. (F)
Prerequisite(s): EDD 485 or EDD 585
Restriction(s):
Can enroll if Class is Graduate

EDD 685  Adv Science Meth: Elem & MS  3 Credit Hours
This course is designed for students interested in utilizing the research in science education at the elementary and middle school levels. Students will study historical and philosophical perspectives that have shaped thinking and research related to science education. They will also be involved in the latest methods and techniques for science teaching and learning. Topics will include the use of inquiry methodologies, science education research, integration of science and other core subject areas, and current science education reform efforts. (F)
Prerequisite(s): EDD 485 or EDD 585
Restriction(s):
Can enroll if Class is Graduate

EDD 717  Sem in Curriculum and Practice  3 Credit Hours
This course will prepare doctoral candidates a framework from which to focus on in their particular field of study. During this course we will review major curriculum theories past and present within U.S. education and work toward applying these models in the practice of developing curriculum and reforming instructional practice. Emphasis is given to considering ways in which teachers and administrators might inquire into curriculum selection and teaching practice at the PK-12 or community college levels.
Restriction(s):
Can enroll if Level is Doctorate or
**EDD 719 Review of Research on Teaching 3 Credit Hours**

The goal of this course is to review the historical and current literature for Research on Teaching. Students will develop an understanding of the critical issues and best practices for teaching and learning. They will also critically analyze the different methods of conducting research on teaching.

**Prerequisite(s):** EDD 717

**Restriction(s):**
Can enroll if Level is Rackham or Graduate or Doctorate

**Other Content**

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

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* An asterisk denotes that a course may be taken concurrently.

**EDuc K-Independent Study (EDK)**

**EDK 500 Intro to Research in Education 3 Credit Hours**

An introduction for classroom teachers to the process of reviewing, evaluating, conducting, and disseminating educational research. Designed to help teachers evaluate research findings and their applications to classroom practice.

**Restriction(s):**
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Graduate
Can enroll if College is Education, Health, and Human Services

**EDK 610 Scholarly Writing 1 Credit Hour**

This seminar is designed to enhance the capacity of graduate students in education to write for academic and professional purposes. It guides students through the process of academic writing including: editing, developing their academic voice, following the APA style manual, writing for a specific purpose, developing audience awareness, and using feedback and editing to improve writing. The course will use a writers' workshop model where students will share their writing and provide constructive feedback to each other. (F, W, S)

**EDK 623 Quantitative Research Methods 3 Credit Hours**

This course provides an introduction to quantitative methods for research in education. Topics explored include the logic of research design, using SPSS, graphical displays of both univariate and bivariate distributions, statistical inference and significance testing, contingency tables, t-tests, ANOVA, and regression. (YR)

**Prerequisite(s):** EK 500

**EDK 625 Qualitative Research Seminar 3 Credit Hours**

This course introduces students to qualitative research in education. Using qualitative research in educational settings places the lived experiences of individuals and/or communities as the core of analysis and is grounded in a theoretical framework that relies on multiple perspectives of the same setting. During this course students will be introduced to the key tools used for qualitative research, through readings, discussions, and application. (YR)

**Prerequisite(s):** EK 500

**EDK 680 Individual Res in Education 1 to 3 Credit Hours**

Requires the student to initiate and carry out a research project under the supervision of a staff member. May be elected more than once for a total of not more than three credits as approved by an advisor.

**Restriction(s):**
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Graduate
Can enroll if College is Education, Health, and Human Services

**EDK 690 Internship/Directed Field Exp 1 to 3 Credit Hours**

Allows the student to practice skills in the field in which the student has been trained. Develops greater competence in skill use. The staff member under whose direction the work is to be done, or a program coordinator, will make arrangements with the field supervisor who will furnish a report of the student's work. May be elected more than once for a total of not more than three credits as approved by an advisor.

**Restriction(s):**
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Graduate
Can enroll if College is Education, Health, and Human Services
EDK 700  Intro to Research in Education  3 Credit Hours
An introduction for classroom teachers to the process of reviewing, evaluating, conducting, and disseminating educational research. Designed to help teachers evaluate research findings and their applications to classroom practice.
Restriction(s):
Can enroll if College is Education, Health, and Human Services

EDK 810  Scholarly Writing  1 Credit Hour
This seminar is designed to enhance the capacity of doctoral students in education to write for academic and professional purposes. It guides students through the process of academic writing including: editing, developing their academic voice, following the APA style manual, writing for a specific purpose, developing audience awareness, and using feedback and editing to improve writing. The course will use a writers’ workshop model where students will share their writing and provide constructive feedback to each other.
Restriction(s):
Can enroll if Class is Doctorate

EDK 823  Quantitative Research Methods  3 Credit Hours
This course provides an introduction to quantitative methods for research in education. Topics explored include the logic of research design, using SPSS, graphical displays of both univariate and bivariate distributions, statistical inference and significance testing, contingency tables, t-tests, ANOVA, and regression.
Prerequisite(s): EDK 500 or EDK 700
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDK 825  Qualitative Research Seminar  3 Credit Hours
This course introduces students to qualitative research in education. Using qualitative research in educational settings places the lived experiences of individuals and/or communities as the core of analysis and is grounded in a theoretical framework that relies on multiple perspectives of the same setting. During this course students will be introduced to the key tools used for qualitative research, through readings, discussions, and application.
Prerequisite(s): EDK 500 or EDK 700
Restriction(s):
Cannot enroll if Class is is
Cannot enroll if Level is Specialist or Doctorate or
Cannot enroll if Degree is Doctor of Education

EDK 850  Resrch Dsgn & Proposal Dvlpmt  3 Credit Hours
This course will provide an introduction and overview of proposal development in preparation for writing a dissertation or applied studies project. It addresses basic proposal development stages faced by pre-doctoral candidates. The course provides an introduction and guidance to the appropriate selection of research design. This is a computer assisted course.
Prerequisite(s): EDK 823 and EDK 825
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Doctorate or
Can enroll if Degree is Doctor of Education
Can enroll if College is Education, Health, and Human Services

EDK 880  Individual Res in Education  1 to 3 Credit Hours
Requires the student to initiate and carry to completion a research project under the supervision of a staff member. May be elected more than once for a total of not more than three credits as approved by an advisor.
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDK 890  Intern/Direct Field Experience  1 to 3 Credit Hours
Allows the student to practice skills in the field in which the student has been trained. Develops greater competence in skill use. The staff member under whose direction the work is to be done, or a program coordinator, will make arrangements with the field supervisor who will furnish a report of the student’s work. May be elected more than once for a total of not more than three credits as approved by an advisor.
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDK 990  Ed.D. Prelim Exam/Proposal  3 to 6 Credit Hours
EDK 990 is for students planning to complete their preliminary examinations and submit and defend their dissertations or applied studies project proposals. The preliminary examination includes two parts that need to be completed in a one-week period. Students will write a paper that demonstrates the depth of their knowledge in the four concentration areas of the doctoral program and their ability to apply that knowledge in a thoughtful analysis of a case study selected by their Doctoral Committee. Students will write a paper that demonstrates the depth and breadth of their knowledge of the theoretical issues and empirical research related to their area of concentration and the relationship between their area of concentration and the broader field of education. Their Doctoral Committee will establish the goals and guidelines for the paper. To successfully complete the proposal for a dissertation, students will submit and orally defend a paper of sufficient length, depth, and complexity that demonstrates their ability to identify a significant and worthwhile problem, select a method or methods of research, apply these methods properly and present the entire effort in writing that is clear and cogent. To successfully complete the proposal for an applied studies project, students will submit and orally defend a paper of sufficient length and complexity that demonstrates their ability to identify a significant and worthwhile problem, use appropriate theoretical and empirical studies to develop a response to the problem and assess the effectiveness of the response, and present the entire effort in writing that is clear and cogent.
Restriction(s):
Can enroll if Class is Doctorate
Can enroll if Level is Doctorate or
Can enroll if Degree is Doctor of Education

EDK 992  Dissertation/Applied Study  1 to 4 Credit Hours
Full Course Title: Dissertation/Applied Study for EdD Dissertation/Applied study is required for all students in the EdD who have completed all of the core and concentration area coursework. Students must maintain registration in EDK 992 until they have completed the program. Students must register for a minimum of 12 credit hours before completing the program. (F,W,S)

EDK 995  Ed.D. Dissertation/Appl Study  3 to 9 Credit Hours
Course for dissertation or applied studies work for students who have been approved for candidacy.
Prerequisite(s): EDK 990
Restriction(s):
Can enroll if Class is Doctorate
Can enroll if Level is Doctorate or
Can enroll if Degree is Doctor of Education

Other Content
* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

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- (S) summer term;
- (F, W) fall and winter terms;
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- (AY) alternating years;
- (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

**Educ M-Community & Bilingual (EDM)**

**EDM 505  TESOL Strategies  3 Credit Hours**

This course examines a variety of instructional approaches to teaching English to speakers of other languages (TESOL). These approaches will be discussed in light of underlying language learning theories. Instructional materials representing various approaches to TESOL will be examined. Students will also have the opportunity to construct instructional materials for use in TESOL.

**Restriction(s):**

Can enroll if Class is Graduate

**EDM 510  Teach Eng for Specific Purpose  3 Credit Hours**

Full Course Title: Teaching English for Specific Purposes This course is designed to provide the knowledge and skills to teach adult speakers of other languages to use English for specific purposes. These are students who will already have a working knowledge of English, but need to have more specialized language for professional, academic and/or job-related skills.

**Other Content**

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering:

- (F) fall term;
- (W) winter term;
- (S) summer term;
- (F, W) fall and winter terms;
- (YR) once a year;
- (AY) alternating years;
- (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

**Educ N-Special Education (EDN)**

**EDN 501  Strategies for LD  3 Credit Hours**

Content includes strategies for teaching students with learning disabilities in special and regular education classes. Course addresses diagnostic-prescriptive teaching, direct instruction, and specific strategies and materials addressing each academic area. The individualized education program (IEP), development of goals and objectives, linking assessment and instruction, inclusion, and generality of behavior change will also be included.

**Prerequisite(s):** EDM 501

**Restriction(s):**

Can enroll if Class is Graduate

**EDN 502  Social/Vocational Transitions  3 Credit Hours**

Course includes strategies that teach age-appropriate social skills to elementary students with learning disabilities. Topics include interactive skills, self-management skills, self-concept, attitude, communication skills particularly pragmatics, assessing social skills, and differential responding in a variety of social settings found in the school, home, and community.

**Prerequisite(s):** EDM 501

**Restriction(s):**

Can enroll if Class is Graduate

**EDN 503  Assessment of the Learner  3 Credit Hours**

Formal and informal assessment strategies used in the identification and service of students with handicaps are described. Technical and operations aspects of standardized testing, curriculum-based assessment, and informal strategies are described.

**Prerequisite(s):** EDM 501

**Restriction(s):**

Can enroll if Class is Graduate

**EDN 504  Assessment Practicum  1 Credit Hour**

Clinical experiences with formal and informal assessment strategies currently used by special educators to identify and program for students with disabilities. Activities include administration, scoring, and interpretation of norm- and criterion-referenced tests, curriculum-based assessments, and informal assessment strategies. Deriving goals, objectives, activities, and strategies from assessment data are also included. Must be taken concurrently with EDN 503.

**Prerequisite(s):** EDM 501

**Restriction(s):**

Can enroll if Class is Education, Health, and Human Services

**EDN 505  Teaching Students with ADD  2 to 3 Credit Hours**

Identification of the behavioral characteristics and instructional needs of students with attention deficit disorders and/or hyperactivity will be discussed. Conducting and interpreting assessment, promoting academic skill gains, sustained attention, task involvement, self-management and functional social skills, and managing hyperactive and hypoactive behaviors will be addressed. Strategies to support and promote family involvement and self-esteem will be described.

**Prerequisite(s):**

Can enroll if Class is Graduate

Can enroll if College is Education, Health, and Human Services
EDN 506  Collaboration in the Classroom  3 Credit Hours
Techniques for enhancing collaboration between special and regular classroom teachers of mainstreamed exceptional and low-achieving learners at all levels. Included are essential skills for managing and monitoring the learning process and maintaining collaborative partnerships.

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Graduate
Can enroll if College is Education, Health, and Human Services

EDN 507  Ed of the Emotionally Impaired  2 Credit Hours
Explores educational strategies for the emotionally disturbed and behaviorally disordered. Emphasis is given to etiological factors and prescriptive approaches to teaching. The role of the teacher as a consultant, a modifier of behavior, and a learning strategist is explored.

Prerequisite(s): EDC 561

Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDN 508  Internship Seminar - LD  1 Credit Hour
Seminar will focus on the discussion, development, and evaluation of Individualized Educational Programs, Individualized Transition Plans, and Behavior Intervention Plans for students with learning disabilities at a variety of internship sites. Topics will include academic and behavior assessment and strategies, curriculum, child study teaming, service delivery options and inclusion strategies.

Prerequisite(s): EDC 501 and EDN 501 and EDN 503 and EDN 504

EDN 520  Intro to Emotional Impairments  3 Credit Hours
Identification of the behavioral characteristics and instructional needs of children with emotional impairments/behavior disorders will be discussed. Causes of emotional impairments and environmental influences on behavior will also be discussed. Strategies for identification, assessment, and interpreting such instruments will be addressed. Finally, instructional strategies for students with emotional impairments will be described and practiced through classroom activities. (YR).

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDN 521  Practicum at Psych Facility  1 Credit Hour
Experience in a clinical setting with emotionally impaired individuals, for no less than 45 clock hours. Activities include working with cooperating teacher on tasks such as individual tutoring, data collection, informal assessment, and program implementation and evaluation. Also included will be the development of goals and objectives relevant for emotionally impaired students. (YR).

Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate

EDN 522  Emotional Impairments Intnsnshp  3 Credit Hours
Field experience with elementary/secondary students with emotional impairments in classroom setting. Experiences include delivery of direct instruction, observations, tutoring, small and large group instruction, curriculum development, program development, and implementation and participation in the IEP process. Collaboration with regular classroom teachers, and other activities under the on-site supervision of an EI certified teacher and an EI-certified university field supervisor. Internship also includes weekly seminar. This course has EDN 520, EDN 525, EDN 526, EDN 523 with a “B” or better as prerequisites. (YR).

Prerequisite(s): EDN 520 and EDN 523 and EDN 525 and EDN 526

EDN 523  Strat: Emotional Impairments  3 Credit Hours
Course content includes strategies for teaching students with emotional impairments, including instruction on reading and mathematics. Course also includes strategies to deal with hyperactive behavior, aggressive behavior, socially withdrawn behavior, and delinquency. Strategies for effective teaching, and the development of instructional materials and learning environments for students with emotional impairments is included. The Individualized Educational Program, development of goals and objectives, linking assessment with instruction, and integrating students with emotional impairments into the regular classroom will also be covered. EDN 520 or EDC 501 is a prerequisite. (YR).

Prerequisite(s): EDN 520 or EDC 501

EDN 524  Couns Fam of Studts Emo Impair  2 Credit Hours
Course content focuses on preparing teachers to work with parents and families, to meet the academic, emotional, social and behavioral needs of students with emotional impairments. Issues concerning counseling families and students in educational settings will be discussed. Strategies for individual and group counseling will also be addressed and practiced through classroom activities. (YR).

Prerequisite(s): EDN 520

EDN 525  Eco-Behavioral Assessment  2 or 3 Credit Hours
Formal and informal assessment strategies used in identifying and serving students with emotional impairments are described. Assessment strategies include eco-behavioral assessment, functional analyses, naturalistic observation techniques, norm-referenced and criterion referenced tests, interviewing, achievement tests, and curriculum based assessment. Technical aspects of assessment, interpretation of data, and diagnostic strategies are also addressed, as well as using assessment instruments to facilitate more effective teaching for students with emotional impairments. To be taken concurrently with EDN 526. (YR).

Prerequisite(s): EDN 520 or EDC 501

Restriction(s):
Can enroll if Class is Graduate

EDN 526  Eco-Behav Assessment Practicum  1 Credit Hour
Clinical experiences with formal and informal assessment strategies currently used by special educators to identify and program for students with emotional impairments. Activities include practicing observation techniques, completing and analyzing eco-behavioral assessments and functional analyses. Also included are administration, scoring, and interpretation of norm-referenced and criterion referenced tests, curriculum based assessments, achievement tests, rating scales and checklists, and informal assessment strategies. To be taken concurrently with EDN 525. (YR).

Prerequisite(s): EDN 520

Corequisite(s): EDN 525

EDN 527  Inclusion:Multisen/Direct Inst  2 to 3 Credit Hours
Course addresses developing, implementing, and evaluating teaching strategies and materials that incorporate principles of direct instruction and multi-sensory activities that promote inclusion of students with special needs in general education settings, increase all students’ academic achievement, and improve social interaction among students from a wide variety of social, economic, and cultural backgrounds. (F,W,S).

Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

EDN 580  Mentally Impaired Child  2 to 3 Credit Hours
A course specially designed for regular classroom teachers to better equip them for effectively teaching children with mental impairments.

Restriction(s):
Can enroll if Class is Graduate
EDN 701  Strategies for LD  3 Credit Hours
Content includes strategies for teaching students with learning disabilities in special and regular education classes. Course addresses diagnostic-prescriptive teaching, direct instruction, and specific strategies and materials addressing each academic area. The individualized education program (IEP), development of goals and objectives, linking assessment and instruction, inclusion, and generality of behavior change will also be included.
Prerequisite(s): EDC 501
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDN 702  Social/Vocational Transitions  3 Credit Hours
Course includes strategies that teach age-appropriate social skills to elementary students with learning disabilities. Topics include interactive skills, self-management skills, self-concept, attitude, communication skills particularly pragmatics, assessing social skills, and differential responding in a variety of social settings found in the school, home, and community.
Prerequisite(s): EDC 501 or EDN 520
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDN 703  Assessment of the Learner  3 Credit Hours
Formal and informal assessment strategies used in the identification and service of students with handicaps are described. Technical and operations aspects of standardized testing, curriculum-based assessment, and informal strategies are described.
Prerequisite(s): EDC 501
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDN 706  Collaboration in the Classroom  3 Credit Hours
Techniques for enhancing collaboration between special and regular classroom teachers of mainstreamed exceptional and low-achieving learners at all levels. Included are essential skills for managing and monitoring the learning process and maintaining collaborative partnerships.
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDN 720  Intro to Emotional Impairments  3 Credit Hours
Identification of the behavioral characteristics and instructional needs of children with emotional impairments/behavior disorders will be discussed. Causes of emotional impairments and environmental influences on behavior will also be discussed. Strategies for identification, assessment, and interpreting such instruments will be addressed. Finally, instructional strategies for students with emotional impairments will be described and practiced through classroom activities. (YR).
Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if Level is Specialist or Doctorate or
Can enroll if College is Education, Health, and Human Services

EDN 723  Strat: Emotional Impairments  3 Credit Hours
Course content includes strategies for teaching students with emotional impairments, including instruction on reading and mathematics. Course also includes strategies to deal with hyperactive behavior, aggressive behavior, socially withdrawn behavior, and delinquency. Strategies for effective teaching, and the development of instructional materials and learning environments for students with emotional impairments is included. The Individualized Educational Program, development of goals and objectives, linking assessment with instruction, and integrating students with emotional impairments into the regular classroom will also be covered. EDN 520 or EDC 501 is a prerequisite. (YR).
Prerequisite(s): EDC 501 or EDN 520
Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDN 725  Eco-Behavioral Assessment  2 to 3 Credit Hours
Formal and informal assessment strategies used in identifying and serving students with emotional impairments are described. Assessment strategies include eco-behavioral assessment, functional analyses, naturalistic observation techniques, norm-referenced and criterion referenced tests, interviewing, achievement tests, and curriculum based assessment. Technical aspects of assessment, interpretation of data, and diagnostic strategies are also addressed, as well as using assessment instruments to facilitate more effective teaching for students with emotional impairments. To be taken concurrently with EDN 526. (YR).
Prerequisite(s): EDC 501 or EDN 520
Restriction(s):
Can enroll if Class is Specialist or Doctorate

Other Content
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

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Frequency of Offering
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Edc T-Education Technology (EDT)

EDT 500  Instrl Media Meth and Matri  1 to 2 Credit Hours
Explores the technology, the production, and the effective use of audiovisual media instructional purposes in a variety of settings.
Restriction(s):
Can enroll if Level is Graduate
EDT 501 Rsrch, Trnds&Iss in Ed Technlgy  3 Credit Hours
This course is designed to acquaint the students with research and issues facing education in the digital era. This course will look at the wide range of developments in technology and investigate the trends that are impacting the field of educational technology. Students explore and analyze key issues related to technology in the classroom of the twenty-first century. (F)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDT 502 Survey of Educ Tech Tools  3 Credit Hours
This course provides students with a general overview of relevant educational software and hardware technologies as well as web-based digital resources that can be used in instructional settings. The students will learn how to identify, select and integrate a broad range of technologies into different learning environments. Students will also create several technology-based instructional products using various tools, applications, and authoring environments.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDT 510 Teaching with Technology  3 Credit Hours
Introduces students to the management and integration of technology in education. Students experience and become familiar with technologically based teaching and learning materials; learn methodologies for using technology in specific teaching situations including audiovisual and media methods methods; develop skills effectively evaluating educational software; explore how technology can be used as a problem-solving tool within the classroom environment; and become familiar with application programs, telecommunications and multimedia.
Students also log a minimum of 45 hours of practicum experience n an instructional capacity where they have the opportunity to implement a variety of technology-enhanced learning activities that they create (F,W,S).
Prerequisite(s): EDT 501 and EDT 502 and EDT 514
Restriction(s):
Can enroll if Class is Graduate

EDT 511 Design Tech-Based Learn Solutn  3 Credit Hours
EDT 511 provides students with the opportunity to design and develop technology-based learning solutions for real-world instructional problems. Students will identify an instructional problem, collect data to assess relevant needs of an authentic population of learners and work collaboratively to create learning solutions for face-to-face, blended and/or online environments. Students will also become proficient in the operation of various pieces of hardware and software and develop skills for evaluating and integrating technology into the different learning environments.
Restriction(s):
Can enroll if Class is Graduate

EDT 512 Human Performance Improvement  3 Credit Hours
This course addresses organizational and human behaviors that affect performance. Causes of performance deficits will be examined and possible solutions linking business goals to interventions will be considered.
Restriction(s):
Can enroll if Class is Undergrad Certification only or Post-baccalaureate Cert only or Junior or Senior or Graduate

EDT 513 Analyzing Human Performance  3 Credit Hours
Students will practice human performance design, sampling, surveys, and statistical analysis in the analysis of performance problems in local companies. Different modes of performance analysis will be demonstrated. (F, W).
Prerequisite(s): EDT 512
Restriction(s):
Can enroll if Class is Graduate

EDT 514 Application of Instrl Design  3 Credit Hours
The course provides students with necessary skills to apply Technological Pedagogical Content Knowledge (TPCK) instructional design process in a specific subject area.
Prerequisite(s): EDT 501 and EDT 502
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Undergrad Certification only or Graduate
Can enroll if College is Education, Health, and Human Services

EDT 516 Application of Distance Learn  3 Credit Hours
Students will use cameras, microphones, VCRs, computers, and other equipment to manage video conferences and other forms of distance education. Students will research distance learners' satisfaction and retention of distance learning applications.
Prerequisite(s): EDT 505 and EDT 512 and EDT 514
Restriction(s):
Can enroll if Level is Graduate

EDT 517 Evaluating PI Interventions  3 Credit Hours
Students will learn several models for evaluating performance interventions. Concepts of validity, reliability, item analysis and culture bias will be included.
Prerequisite(s): EDT 512
Restriction(s):
Can enroll if Level is Graduate

EDT 519 Select & Design Interventions  3 Credit Hours
Students will learn appropriate interventions for remedying typical performance problems. Students will also learn to manage and monitor the implementation process. (F, W).
Prerequisite(s): EDT 512 and EDT 513 and EDT 517
Restriction(s):
Can enroll if Level is Graduate

EDT 520 Intro to Teaching/Learn Online  3 Credit Hours
This course will introduce students to best practices in the design, creation and implementation of instructional materials in an online environment. Students will create and implement several instructional activities and assessments in blended, hybrid and online environments.
Restriction(s):
Can enroll if Class is Graduate

EDT 521 Transitioning to HPI  3 Credit Hours
Students will learn tools for analyzing organizational readiness for change. Students will plan an intervention cycle including preparing for change, designing the intervention, and comparing anticipated and actual results.
Prerequisite(s): EDT 512 and EDT 513 and EDT 517 and EDT 519
Restriction(s):
Can enroll if Level is Graduate
EDT 522 Educating the Digital Learner 3 Credit Hours
This course builds upon knowledge learned in EDT 520. Students are introduced to Universal Design for Learning (UDL) theory and how to apply it to learning activities in the blended, hybrid and online environment. Emphasis is placed on learning how to make accommodations for students in the online environment as well. Students will also learn to critically assess different approaches to online instruction.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services
Cannot enroll if Program is

EDT 530 Assistive Technology 3 Credit Hours
This course is designed as an introductory course in assistive technology (AT) including the history, relevant legislation, and development of assistive technology. Students will be introduced to key AT categories by function including high tech and low tech assistive hardware, software and mobile devices to increase learning opportunities for individuals with disabilities.

EDT 531 Lead. & Prof. devel in Ed Tech 3 Credit Hours
This field-based course provides students with necessary skills to design and practice methods and strategies for providing effective professional development programs for teachers and to demonstrate leadership in technology learning practices and techniques in K-12 environment. This course is designed as a capstone course and should be taken in the final semester of the program.

Prerequisite(s): EDT 510 and EDT 501 and EDT 502 and EDT 514 and EDT 520 and EDT 522

Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDT 562 EDT Internship/Seminar 3 Credit Hours
A supervised field experience in which students will work in a K-12 technology program for 120 clock hours. In this internship students will serve as instructional staff, developing knowledge of and experience in managing resources, assessing students, working with students to develop technology literacy, and assisting another teacher in integrating technology into the classroom. In addition, a weekly seminar to explore issues related to K-12 technology programs will be held. (F, W).

Restriction(s):
Can enroll if Class is Graduate

EDT 580 Appl of Tech for Organ Admin 2 or 3 Credit Hours
FULL TITLE: Applications of Technology for Organizational Administrators. This course will focus on the role of organizational administrators in the applications of technology within and organization, including policy development, personnel management, financial planning and budgeting, program planning and evaluation, training, and strategic planning.

Restriction(s):
Can enroll if Class is Graduate

EDT 582 Survey of Educ Tech Tools 3 Credit Hours
This course provides students with a general overview of relevant educational software and hardware technologies as well as web-based digital resources that can be used in instructional settings. The students will learn how to identify, select and integrate a broad range of technologies into different learning environments. Students will also create several technology-based instructional products using various tools, applications, and authoring environments.

Restriction(s):
Can enroll if Level is Specialist or Doctorate or
Can enroll if College is Education, Health, and Human Services

EDT 714 Application of Instrl Design 3 Credit Hours
The course provides students with necessary skills to apply Technological Pedagogical Content Knowledge (TPCK) instructional design process in a specific subject area.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDT 720 Intro to Teaching/Learn Online 3 Credit Hours
This course will introduce students to best practices in the design, creation and implementation of instructional materials in an online environment. Students will create and implement several instructional activities and assessments in blended, hybrid and online environments.

Prerequisite(s): EDT 505 or EDT 514

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDT 722 Educating the Digital Learner 3 Credit Hours
This course builds upon knowledge learned in EDT 720. Students are introduced to Universal Design for Learning (UDL) theory and how to apply it to learning activities in the blended, hybrid and online environment. Emphasis is placed on learning how to make accommodations for students in the online environment as well. Students will also learn to critically assess different approaches to online instruction.

Prerequisite(s): EDT 720

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDT 731 Lead. & Prof. devel in Ed Tech 3 Credit Hours
This field-based course provides students with necessary skills to design and practice methods and strategies for providing effective professional development programs for teachers and to demonstrate leadership in technology learning practices and techniques in K-12 environment. This course is designed as a capstone course and should be taken in the final semester of the program.

Prerequisite(s): EDT 510

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EDT 758 Technology for Administrators 3 Credit Hours
This course will focus on the role of educational administrators in the applications of technology within a school, including policy development, personnel/student management, financial planning and budgeting, curricular planning and evaluation and professional development.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

Other Content

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Frequency of Offering
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Education Mathematics (EDMA)

EDMA 511 Lng & Tchg Middle Grade Math 3 Credit Hours
This course addresses issues central to teaching and learning mathematics in middle grades; building learning communities, how students learn mathematics, use of worthwhile mathematical tasks, instructional modes, technology options, assessment to inform instruction, and professional perspectives. (Y).
**Prerequisite(s):** MATH 443 or MATH 543
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or Professional Development
Can enroll if College is Education, Health, and Human Services

EDMA 512 Comm and Assmt in Math Lrng 3 Credit Hours
Problems and strategies for making effective the reading, symbolizing, graphing, diagramming, explaining, and writing of mathematical concepts and solutions: multiple uses and forms of assessment. (W)
**Prerequisite(s):** (MATH 442 or MATH 542) and (MATH 443 or MATH 543)
**Restriction(s):**
Can enroll if Class is Specialist or Graduate
Can enroll if College is Education, Health, and Human Services
Can enroll if Major is Education

EDMA 521 Leadership in Mathematics Educ 3 Credit Hours
This course focuses on leadership concerns in mathematics education at the middle grades level. Topics may include school reform; staff development; program review; communicating with the community; new teacher induction; proposal writing. Open only to graduate students or by permission of the instructor. (Y).
**Prerequisite(s):** EDMA 512
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or Professional Development
Can enroll if College is Education, Health, and Human Services

EDMA 525 Currm Devt & Rsch in Math Ed 3 Credit Hours
Curriculum Development and Research in Mathematics Education is a capstone course for leadership in mathematics education. It addresses recent research in mathematics education and the design, implementation, and evaluation of research-based curriculum development; action research methods; and applications.
**Prerequisite(s):** EDMA 512 and EDMA 521
**Restriction(s):**
Can enroll if Class is Graduate

EDMA 590 Topics in Math Education 1 to 3 Credit Hours
This course focuses on mathematics education topics of current or emerging interest, such as current research; current curriculum development; issues related to school organization; new technologies; new national, state, or local initiatives; focused fieldwork; and equity concerns. Open only to graduate students or by permission of instructor. Course may be repeated for up to six hours when specific topics differ. (OC).
**Restriction(s):**
Can enroll if Level is Rackham or Graduate or Professional Development
Can enroll if College is Education, Health, and Human Services

EDMA 598 Independent Study in Math Ed 1 to 6 Credit Hours
Independent study in Mathematics Education under the supervision of a faculty member.
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EDMA 712 Comm and Assmt in Math Lrng 3 Credit Hours
Problems and strategies for making effective the reading, symbolizing, graphing, diagramming, explaining, and writing of mathematical concepts and solutions: multiple uses and forms of assessment. (W)
**Prerequisite(s):** (MATH 442 or MATH 542) and (MATH 443 or MATH 543)
**Restriction(s):**
Cannot enroll if Class is Doctorate
Cannot enroll if Major is Education

EDMA 721 Leadership in Mathematics Educ 3 Credit Hours
This course focuses on leadership concerns in mathematics education at the middle grades level. Topics may include school reform; staff development; program review; communicating with the community; new teacher induction; proposal writing. Open only to graduate students or by permission of the instructor. (Y).
**Prerequisite(s):** EDMA 512
**Restriction(s):**
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

EDMA 725 Curric Devl&Rsch in Math Ed 3 Credit Hours
Curriculum Development and Research in Mathematics Education is a capstone course for leadership in mathematics education. It addresses recent research in mathematics education and the design, implementation, and evaluation of research-based curriculum development; action research methods; and applications.
**Prerequisite(s):** EDMA 512 and EDMA 521
**Restriction(s):**
Can enroll if Class is Specialist or Doctorate

EDMA 798 Independent Study in Math Ed 1 to 6 Credit Hours
Independent study in Mathematics Education under the supervision of a faculty member.
**Restriction(s):**
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services

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Frequency of Offering

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Electrical&Computer Engin (ECE)

ECE 500  Math Mthds for Elec & Comp Eng  3 Credit Hours
Topics include: Transform Techniques using Fourier series, Fourier transforms, Laplace transforms and Sampling Theorem. Linear Algebra using eigen expansions, polynomial functions and matrices and determinants. Random Variables using probability density and distribution functions, functions of a random variable, and conditional and joint probabilities.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 5001  Analytic and Comp Math  3 Credit Hours
Full Title: Analytical and Computational Mathematics This course covers selected topics in applied mathematics useful in science and engineering fields, including: solution of linear equations, polynomial interpolation and approximation, solution of nonlinear equations, roots of polynomials, resultants, approximation by orthogonal functions (includes Fourier series), ordinary differential equations, optimization, calculus of variations, probability and stochastic processes, computational geometry, and differential geometry. In addition to providing students with necessary mathematical knowledge for their future course study and research projects, students will be required to program in MATLAB and/ or other languages to gain and improve programming ability. Students in RE program must take this course in the first year. This course cannot be taken with ECE 500. Three lecture hours per week. (F)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 502  Electromag Theory & Simul  3 Credit Hours
The course will cover basic devices and applications in Electromagnetic waves. The course will use examples of electromagnetic devices that operate at low frequency, (e.g., coils and motors), and others that operate at high frequency (e.g., Optical fiber, Laser, Imaging Sensor, LEDs, Solar cells and Antenna.) The course will develop fundamental understandings for the behavior of these devices. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer Engineering, Electrical Engineering

ECE 505  Intro to Embedded Systems  3 Credit Hours
Introduction to modern digital computer logic. Numbers and coding systems; Boolean algebra with application to logic systems; examples of digital logic circuits; simple machine language programming and Assembly and C/C++ programming language; microprocessors programming (both assembly and C/C++) for input/output, interrupts, and system design. (May not be available to students with EE or CE degrees) Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 507  Intro to Multimedia Sys  3 Credit Hours
This course is designed to provide a broad overview of the engineering, art, and business of developing multimedia systems. In terms of technical and engineering issues, students will learn basic data analysis techniques and computer programming tools. In terms of art and media, students will learn the basics of human perception, communication, and aesthetics. In terms of business, students will learn how to identify customer needs and think like an entrepreneur. By learning and understanding the working vocabulary of each of these three fields, students will be able to contribute creative and effective multimedia-based solutions to interesting real-world problems. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 510  Vehicle Electronics I  3 Credit Hours
This course discusses the principles of electrical engineering and applications of electrical and electronic systems in automobiles, including resistive, inductive, and capacitive circuit analysis, semiconductor diodes, junction transistors, FETS, rectifiers, and power supplies, small signal amplifiers, biasing considerations, gain-bandwidth limitations, circuit models. Some automotive EE applications are used for case study. Three lecture hours per week. (Not open to students with EE degree.)
Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 512  Analog Filter Design  3 Credit Hours
This course addresses the analysis and design of continuous time (analog) and switched-capacitor filters. Students will analyze and design filters. Effect of tolerances of circuit elements on the performance of the circuit behavior will be analyzed. Students will use simulation tools to design filters and verify circuit performance. Three lecture hours per week.
Prerequisite(s): ECE 314
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 513  Computer-Aided Network Design  3 Credit Hours
Numerical methods required for circuit analysis and design using digital computers are investigated. These techniques include matrix analysis of linear systems; network graphic theory, tolerance analysis, transient analysis, numerical integration, nonlinear circuit analysis, network optimization, and device modeling. Practical examples are given requiring the construction of computer subroutines and use of general analysis programs such as ECAP and CIRAN. Three lecture hours.
Prerequisite(s): ECE 410
Restriction(s):
Can enroll if Class is Graduate

ECE 519  Electrical & Computer Engineering Review
Electrical & Computer Engineering Review

ECE 521  Mod & Des of Electric Circuits  3 Credit Hours
Review semiconductor circuit elements in detail to model devices for circuit analysis. Devices include diodes, bipolar junction transistors, MOSFETs and operational amplifiers. Discussion of large signal and small signal (ac) models, frequency effects and non-ideal models. Design circuits such as switching circuits, power supplies, amplifiers, oscillators, non-linear circuits. Students will gain experience in terms of designing, simulating and implementing electronic circuits and systems. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Electrical Engineering, Computer Engineering
ECE 514  VLSI Design  3 Credit Hours
Topics relevant to the design and analysis of VLSI circuits are investigated. These include an introduction to CMOS circuits, their characterization and performance estimation. Logic design and testing of VLSI circuits. Analysis of layout and the design of subsystems. VHDL and commercial CAD packages for VLSI design.
Prerequisite(s): ECE 413
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 515  Vehicle Electronics II  3 Credit Hours
This course discusses advanced topics in electronics with an emphasis on vehicle applications. It will include ignition systems and controls, amplifiers, frequency characteristics of electronic circuits, feedback in electronic systems and stability, power electronics and motor drive controls (DC/DC and DC/AC converters) and EMC issues. Selected examples include applications such as voltage regulators and battery chargers. Three lecture hours per week.
Prerequisite(s): AENG 510

ECE 516  Electronic Materials & IC Proc  3 Credit Hours
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 517  Adv Pwr Electrncs&Motor Drvs  3 Credit Hours
This is an advanced course on power electronics and electric drives. Example topics include DC, induction, synchronous and reluctance drives; industrial and residential application of power electronics; practical aspects of design of power electronics devices including heat sink and magnetic components designs. Three lecture hours per week.
Prerequisite(s): ECE 415
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 518  Mat Selec for Commercial Prod  3 Credit Hours
Impact of modern materials on commercial product performance; representative illustrations from product areas such as automotive vehicles, commercial aircraft, recreational equipment, and electronic products.
Restriction(s):
Can enroll if Class is Graduate

ECE 519  Adv Topics in EMC  3 Credit Hours
This course covers the EMC requirements and EMC test methods for large systems. Examples involving various types of applications (automotive, communications, computers) will be discussed. Discussion of design practices used in large installation, including component segregation, cable routing, connectors, grounding, shielding, common impedance coupling, ground planes, screening and suppression. Classification of electromagnetic environments will also be discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 524  Interactive Media  3 Credit Hours
This course will provide an introduction to computer and human interface and AI, user-interface design from design principles and cognitive perspectives. The course covers such topics innovative multimedia interfaces, design ethics, psychological principles, cognitive models, interaction principles, requirements analysis, project management, I/O devices, standards and styles guides, and visual design principles. This is a project-based class. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

ECE 525  Multimedia Data Stor & Retr  3 Credit Hours
This course will cover the fundamental concepts and techniques used in multimedia data, storage and retrieval including storage and retrieval images, videos, audio and text documents. Selected multimedia applications will be discussed and students will be required to work on a project related to multimedia applications such as advertising and marketing, education and training, entertainment, medicine, surveillance, wearable computing, biometrics, and remote sensing. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5251  MM Design Tools I  3 Credit Hours
This course will introduce students to design tools for multimedia systems. Basic concepts, algorithms, and standards will be covered for systems that process digital images, vector graphics, and text. Models and relevant parameters of display technologies (video and printer) will be discussed. Part of the coursework involves a project concerning the analysis and design of a multimedia-based system. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5252  MM Design Tools II  3 Credit Hours
This course will introduce students to multimedia design tools for dynamic media (video and audio). Basic concepts of digital video will be reviewed, such as resolution and compression standards. Algorithms and methods for video and audio processing and effects will be reviewed. Part of the coursework involves a project concerning the analysis and design of a multimedia-based system. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 526  Multimedia Comm Sys  3 Credit Hours
Object of this course is to introduce current techniques in multimedia communications. This course will cover in-depth study of existing multimedia compression standards such as, MPEG, MJEG, JPEG2000, etc. The course will introduce the basic issues in multimedia communications and networking and is designed to give the student hands-on experience in various aspects of multimedia communications through the various assignments and projects.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 527 Multimedia Secur & Forensics  3 Credit Hours
Object of this course is to introduce current techniques in information security in general and multimedia security in particular. This course will cover existing information hiding techniques such as digital watermarking, steganography, and fingerprinting. The course will also cover basics of cryptography and coding theory. This course will cover the basic issues in multimedia security and forensics and is designed to give the student hands-on experience in various aspects of information security and forensic analysis through the various assignments and projects. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 528 Cloud Computing  3 Credit Hours
Cloud computing represents the emerging Internet-based services/platforms with elastic and scalable computation powers operating at costs associated with service. Topics of the course include advanced web technologies, distributed computing models and technologies, software as a service (SaaS), virtualization, pallelization, security/privacy and the advance in cloud computing. Course work includes building up a SaaS project. Students cannot take both ECE 428 and ECE 528 for degree credit. Three lecture hours per week.
Restriction(s):
Cannot enroll if Class is
Can enroll if Level is Graduate or Doctorate
Cannot enroll if Major is

ECE 529 Intro to Computer Music  3 Credit Hours
This course will introduce students to methods and technologies of computer music. The basics of digital audio will be covered, including sampling, quantization, and compression standards. Various analysis tools will be covered, including the Fourier transform and windowing techniques. Mathematical models of physical instruments will be introduced. Various sound synthesis strategies will be introduced: wave tables, additive synthesis, subtractive synthesis, frequency modulation, and granular synthesis. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 530 Energy Storage Systems  3 Credit Hours
This course introduces the basics of energy storage systems for EDV. It will cover battery basics, ultracapacitors, flywheels, and hybrid energy storage concepts. Battery management, battery charging, and battery safety will be covered. Finally, the requirements of EDV and renewable energy application examples will be explained. Lead acid, nickel metal hydride, and lithium ion batteries will be covered. Other energy storage systems such as super conducting magnetic, hydraulic, compressed air, and integrated (hybrid) energy storage systems, will be discussed as well.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 531 Intelligent Vehicle Systems  3 Credit Hours
The course covers important technologies relevant to intelligent vehicle systems including systems architecture, in-vehicle electronic sensors, traffic modeling and simulation. Students will design and implement algorithms and simulate driver-highway interactions.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or Doctorate
Cannot enroll if Major is

ECE 532 Auto Sensors and Actuators  3 Credit Hours
Study of automotive sensory requirements; types of sensors; available sensors and future needs. Study of functions and types of actuators in automotive systems. Dynamic models of sensors and actuators. Integrated smart sensors and actuators. Term project.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 533 Active Automotive Safety Sys  3 Credit Hours
This course addresses enabling technologies relevant to active automotive safety systems. The study of intelligent vehicle systems includes system architectures, sensors, and algorithms. Modeling and simulation will also be covered. Students will design and simulate systems encompassing important concepts presented in the course. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 535 Mob Dev & Ubiqys Comp Sys  3 Credit Hours
This class will introduce students to the technology used in mobile/ smart devices and mobile communication networks. Various hardware and software aspects will be introduces, with particular emphasis on the constraints intrinsic to such system. Students will get an overview of various mobile operating systems and will learn how to develop software for mobile devices. The topics of ubiquitous and pervasive computing will be introduced and discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is

ECE 536 All Weather Automotive Vision  3 Credit Hours
Coverage of the next generation of active automotive safety systems including intelligent cruise control, lane departure warning, virtual camber, and back-up and blind spot warning systems. Topics include active safety system architecture, enabling technologies for such systems, and future directions. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 537 Data Mining  3 Credit Hours
Introduction to the fundamental concepts of data mining including data exploration, pre-and post-processing, OLAP predictive modeling, association analysis, and clustering. This course also focuses on the analysis of algorithms commonly used for of data mining applications, mining structured, semi-structured and unstructured data, stream data, and web data. Team oriented course project to provide hands-on experience may be required. Three lecture hours per week.
Prerequisite(s): ECE 479 or CIS 479
Restriction(s):
Can enroll if Class is Specialist or Graduate or Doctorate
ECE 539 Production of Elec Prods 3 Credit Hours
The course discussed the manufacturing of discrete components, integrated circuits, hybrid circuits and modules, advances packages, printed circuit boards, optical components, and MEMS products. Special topics on product testing, reliability assurance, accelerated reliability testing, product lifetime models, and automotive environments will also be addressed. The course will be organized as a combination of conventional lectures, workshops-style discussion, and design review sessions. Three lectures hours per week.
Restriction(s):
Can enroll if Major is Electrical Engineering, Manufacturing Engineering, Computer Engineering

ECE 541 Intro to Electrical Energy Sys 3 Credit Hours
The course will cover the sources of energy including coal, nuclear, solar, wind; their impact on the climate; and their technological characteristics in terms of availability, cost and reliability. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Mechanical Engineering, Industrial & Systems Engin, Computer Engineering, Electrical Engineering

ECE 542 Intr to Pwr Mgmt & Reliability 3 Credit Hours
This course will give students an introduction to power and energy management systems. Students will be exposed to a broad range of topics including optimal power flow, Smart Grid technology, economic dispatch, unit commitment, and the impact of renewable energy on power and management systems. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 543 Kinem, Dynam Control Robots 3 Credit Hours
Full Title: Kinematics, Dynamics, and Control of Robots This course provides a systematic study of robotics, covering various topics in kinematics, dynamics, control, and planning for robot systems. The purpose of this course is to let students get familiar with the traditional mathematical description of a robotic system and understand fundamental concepts and principles in robotics, to enable students to derive equations of motion for robotic systems, analyze their kinematic and dynamic properties, and design control strategies, and also to have students gain knowledge and experience about commonly-used robotic systems and mechanisms. Starting with rigid body motion, we will learn a systematic way to describe a robot system that consists of multiple links connected through different kinds of joints. Kinematics will include forward and inverse kinematics and their analytical and constraints.
Control will include the classic PID control, position and force control, and trajectory tracking. This course will also discuss some specific topics in robotics research, including robot manipulators, mobile and walking robots, and robot hands, in which we will see how the above principles and methods are being used together. Three lecture hours per week. (W)
Prerequisite(s): ECE 347
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science

ECE 544 Mobile Robots 3 Credit Hours
This course gives an introduction to all the fundamentals of mobile robots, ranging from theory, such as kinematics, over hardware, such as sensors and motors, to core algorithms for sensory information processing, motion planning and control, and etc. A high level-overview of different types of mobile robots is presented first. Then, theoretical methods for analyzing the kinematic and dynamic properties of a mobile robot are discussed, followed by the discussion on the key subsystems of a mobile robot, including perception, localization, planning and control. For each subsystem, the discussion includes relevant methods for understanding and constructing the model of the environment or planning and controlling the motion of the robot. The course has three lecture hours per week. Students are expected to have knowledge of MATLAB or C/C++ programming and will be required to accomplish a course-related project. Three lecture hours per week. (F)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science

ECE 545 Intro Robot Syst 3 Credit Hours
Full Title: Introduction to Robotic Systems This courses introduces basic components of robotic systems, selection of coordinate frames, homogeneous transformations, solutions to kinematics of manipulators, velocity and force/torque relations, dynamic equations using Euler-Lagrange formulation, obstacle avoidance and motion planning, classical controllers for manipulators and controller design using torque method, and robot simulation tools. Sensing technologies including basic computer vision will be covered. Robot simulation technologies and tools will be introduced. Robotic systems other than manipulators will be introduced at the end of this course. Three lecture hours per week. (F)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 546 Electric Vehicles 3 Credit Hours
To introduce fundamental concepts and specifications of electric and hybrid vehicles; vehicle design fundamentals; motors for electric vehicles; controllers and power electronics; energy sources; engineering impact of electric vehicles and practical design considerations. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 5462 Elec Aspects of Hybrid Vehicle 3 Credit Hours
To introduce fundamental concepts and the electrical aspects of HEV, including the design, control, modeling, battery and other energy storage devices, and electric propulsion systems. It covers vehicle dynamics, energy sources, electric propulsion systems, regenerative braking, parallel and series HEV design, practical design considerations, and specifications of hybrid vehicles. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 550 Communication Theory 3 Credit Hours
The basic limitations and alternatives for communications signaling are studied, using appropriate mathematical tools. The topics include: review of information measure; random process and vector description of signals and noise; optimum receiver principles; signaling alternatives; channel capacity; block and convolutional coding; waveform estimation concepts. Practical system examples are stressed.
Prerequisite(s): ECE 450
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering
ECE 552  Fuzzy Systems  3 Credit Hours
A study of the concept of fuzzy set theory including operations on fuzzy sets, fuzzy relations, fuzzy measures, fuzzy logic, with an emphasis on engineering application. Topics include fuzzy set theory, applications to image processing, pattern recognition, artificial intelligence, computer hardware design, and control systems.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 553  Software/Hardware Rapid Prototy  3 Credit Hours
Rapid prototyping technology is primarily aimed at reducing the lead times and costs associated with new product development. Rapid prototyping requires a good quality 3D CAD system. This course will cover the software and hardware widely used in the rapid prototyping, including Stereolithography (SLA) and virtual reality software and hardware used for rapid prototyping. (YR)
Restriction(s):
Can enroll if Class is Graduate

ECE 554  Embedded Systems  3 Credit Hours
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5541  Embedded Networks  3 Credit Hours
Embedded network systems merge modern communications, networks, sensing, distributed control and mobile computing enabling novel applications in a broad area of control, automation, and distributed real time systems. The course will focus on vehicular communications and networking, autonomous vehicles and intelligent transportation systems, robotics networks, and smart grids. Topics include: an overview of embedded processors and microcontrollers, digital signal processors, field programmable gate arrays (FGPAs), sensors and actuators, embedded operating systems including various Linux and Android platforms, and embedded networks. Students will be exposed to advanced system design methods, modeling, simulation, and system verification and evaluation. A term project may be required. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Specialist or Graduate or or Doctorate

ECE 5542  Embedded Sig Proc and Control  3 Credit Hours
This course bridges the gap between embedded software engineering principles and theoretical signal processing and control concepts. Topics include a survey of embedded software architectures, real-time principles and concerns, sensor and actuator interfacing, PIO feedback control systems, Audio/time-series filtering (FIR and IIR filters), embedded image processing, automatic code generation from higher level modeling languages such as MATLAB and Simulink, and working with single-board computers and digital signal processors (DSP). It is a project oriented course, with hands-on assignments, group projects and an individual research component. (F)
Prerequisite(s): ECE 473 or ECE 4951 or ECE 554
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 5543  Embedded System Security  3 Credit Hours
This course introduces fundamental concepts of information security and threat models. In depth study of the principles, algorithms, techniques, protocols and applications of embedded security, including secure software development, light weight cryptographic algorithms, information security protocols for embedded applications, tamper detection, automotive security, embedded network transactions, and other emerging embedded applications in the areas of IoT and cyber-physical systems will be covered. (W,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 5544  Intro. to CPS Security  3 Credit Hours
This course covers introductory topics in cyber-physical systems (CPSs) security. This course is intended to expose students to fundamentals of security primitives specific to CPSs and to apply them to a broad range of current and future security challenges that such systems are facing. Much of the course addresses Industrial Control Systems and smart grids. However, students will be expected to generalize the concepts for other CPSs. Students will work with various tools and techniques used by hackers to compromise computer systems or otherwise interfere with normal operations. Students will also use tools that are unique to interacting with cyber-physical systems. The purpose of this course is NOT to teach students how to become hackers, but rather to teach them about threat models and attack vectors for cyber-physical systems so that they can develop countermeasures to defend against threats. (F,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 5545  Sec. & Privacy for Smart Grids  3 Credit Hours
Full Course Title: Security and Privacy for Smart Grids The goal of this course is to provide a comprehensive understanding of the challenges, issues, solutions, and state-of-the-art research and best practices pertaining to the cyber-security of the modern power grids, also known as "smart power grids". The course is intended to provide an overview of information security, CPS security, risk assessment and mitigation, network security, attack-resiliency for bulk power systems, attack surface analysis and reduction techniques, cyber-security testbeds, security standards and best practices for critical infrastructure, e.g., smart power grids. This course will build the skills needed to design and test the protocols, policies, and specifications for enabling technologies that will guarantee the security and integrity of the smart power grid while preserving personal privacy. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate
ECE 555  Stochastic Processes  3 Credit Hours
Review of probability and random variables. Introduction to stochastic
processes; stationarity, ergodicity, auto correlation and cross correlation,
linear systems with random inputs, spectral analysis, Wiener filtering,
Kalman filtering. Applications to smoothing, parameters estimation,
prediction, system identification.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 560  Modern Control Theory  3 Credit Hours
Introduction to linear spaces and operators; mathematical description
of multiple input-output systems; state variables and state transition
matrix; controllability and observability and its application to irreducible
realization of transfer function matrices; state variable estimation;
controller synthesis by state feedback; stability of linear systems;
analysis of composite systems.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 565  Digital Control Systems  3 Credit Hours
Mathematical representation of digital control systems; z-transform and
difference equations; classical and state space methods of analysis and
design; direct digital control of industrial processes.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 566  Mechatronics  3 Credit Hours
Mechatronics, as an engineering discipline, is the synergistic combination
of mechanical engineering, electrical engineering, control engineering,
and computer science, all integrated through the design process. The
course is to establish a working familiarity with the key engineering
elements in the design and control of electro-mechanical systems in
general and automotive systems in particular. The key engineering
elements include microprocessor technology, electronics, sensors and
actuators, data communication and interface, control algorithms, and
mechanisms of machine elements. The course is to introduce a design
methodology in an integrated system environment through case studies
and design projects. (AY).
Prerequisite(s): ME 442 or ECE 365
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 567  Computer-Based Automation  3 Credit Hours
Using interactive graphics in process system design. Modeling machine
and process dynamics. Simulating machine and process operations.
Computer control of machines and processes. Machine sensing and
diagnostic systems.
Prerequisite(s): ME 588 or ECE 539
Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 569  Intro to Wireless Comm  3 Credit Hours
A basic introduction to modern wireless communication principles and
architectures. Channel models, signal generation and reception are
explored. Examples of current protocols and architectures of wireless
data and voice networks are studied. Self guided lab assignments. A
project is required. Three lecture hours per week.
Prerequisite(s): ECE 471
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 570  Computer Networks  3 Credit Hours
A study of data communications and network architecture fundamentals.
Topics include signals and data transmission, modulation, encoding,
and public carriers and network architectures; data link network layer,
and transport layer protocols; case studies of existing and emerging
networks; wireless, embedded, and conventional wired systems. Three
lectures hours per week.
Prerequisite(s): ECE 470 or ECE 570
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 571  High-Speed and Adv Networks  3 Credit Hours
The course introduces concepts in protocols and architecture of high-
speed and advanced networks with an emphasis on Internet, ATM
networks, wireless local area networks, cellular systems and wireless
sensor networks. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 572  Sequential Machines  3 Credit Hours
Characterization of complete and incomplete machines, decomposition
and state assignment problems. Deterministic and nondeterministic
finite state machine identification. State-identification and fault-detection
experiments.
Prerequisite(s): ECE 571
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering,
Computer & Information Science

ECE 573  Switching Theory  3 Credit Hours
Combinational and sequential logic design, minimization of
combinational and sequential circuits, functional decomposition, reliable
design and fault diagnosis; incompletely specified sequential machine
design, asynchronous sequential circuits and interactive methods.
Prerequisite(s): ECE 273
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering,
Computer & Information Science

ECE 574  Adn Sftware Technq in Eng Appl  3 Credit Hours
Topics relating to Software Development for engineering applications will
be discussed. These may include data structures, algorithm complexity,
personal software development process, team software process, Six
sigma, DFSS, software techniques, software engineering application, and
software design. Three lecture hours per week.
Prerequisite(s): ECE 474
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering,
Computer & Information Science, Computer Engineering
ECE 577  Computer Architecture  3 Credit Hours
This course addresses the basics of computer architecture including central processing architecture, instruction set design, input/output and RAID, main memory, Cache, and virtual memory. Three lecture hours per week.
Prerequisite(s): ECE 375
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is
ECE 5752  Reconfigurable Computing  3 Credit Hours
This course addresses advances in reconfigurable computing techniques, design, and research. The course topics include introduction to RC, Hardware Description Language (HDL) such as VHDL and Verilog HDL, System-On-Chip (SOC), and Network-On-Chip (NOC). Three lecture hours per week.
Prerequisite(s): ECE 475
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 576  Information Engineering  3 Credit Hours
This course will cover fundamental concepts of information engineering, including theoretical concepts of how information is measured and transmitted, how information is structured and stored, how information can be compressed and decompressed, and information networks such as social networks, affiliation networks and online networks, mathematical theories of information networks. Information engineering applications will be discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 577  Engineering in Virtual World  3 Credit Hours
An in-depth study of selected topics in design and development of virtual systems in industrial environments. Topics include cyberspaces, techniques for generating virtual worlds in engineering applications, building blocks of virtual environments including hardware and software. Case studies.
Prerequisite(s): ECE 273 and ECE 371
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science
ECE 5770  Autonomous UAS  3 Credit Hours
This course will introduce the basic concepts of autonomous unmanned aerial systems. Topics will include basic flight principles of fixed-wing and rotary-wing aircraft, inertial representations in 3D space, the principles of Bayesian state estimation, visual odometry, path planning, and autonomous navigation. This course will also cover aircraft actuation, sensors and perception (GPS, inertial measurements, ranging, and basic computer vision), sensor fusion technique, and motion control of unmanned aircraft. Students are expected to have knowledge of high-level programming language and will be required to accomplish a course project. Three lecture hours per week. (W)
Prerequisite(s): ECE 347 or IMSE 317
Restriction(s):
Can enroll if College is Engineering and Computer Science
ECE 578  Advanced Operating Systems  3 Credit Hours
Advanced techniques and uses in operating system design. Distributed operating systems. Message-based operating systems. Operating systems for parallel architectures. Layered techniques in operating systems. Formal models of operating systems. Current trends in operating system design.
Prerequisite(s): ECE 478 or CIS 450 or IMSE 450
ECE 579  Intelligent Systems  3 Credit Hours
Representative topics include: Intelligent systems design, training and evaluation, decision trees, Bayesian learning, reinforcement learning. A project will be required.
Prerequisite(s): ECE 479
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 5791  Vehicle Power Management  3 Credit Hours
This course provides graduate students with a clear understanding of the latest vehicle power management technologies with an emphasis on alternative fuel vehicles. The course will cover topics such as electrified powertrain configurations. Vehicle power management basic concepts, vehicle propulsion system modeling, vehicle power management approaches (analytical approach, wavelet transform technology, DP&QP and intelligent systems methods). ESS (especially battery) management, power electronics in HESS and motor drive, HEV component optimization, HIL and SIL, vehicle power management future trends, and so on. Three hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
ECE 580  Digital Signal Processing  3 Credit Hours
This course addresses the analysis and design of discrete time signals and systems. Students will become familiar with the mathematical tools needed for digital signal processing such as the Fourier transform, frequency response, the sampling theorem, and z-transform method. Topics covered will include the design of digital filters (IIR and FIR filters), characteristics of analog-to-digital and digital-to-analog converters, the spectral analysis of signals, and discrete filters. Three lecture hours per week.
Prerequisite(s): ECE 300
Restriction(s):
Can enroll if Class is Graduate or Doctorate
ECE 5802  Multirate Sig Proc w/Appi  3 Credit Hours
This course provides an introduction to multirate digital signal processing with application in different fields of engineering, with a focus on the presentation of the theoretical foundation for all aspects of multirate digital signal processing. The course examines modern applications of multirate digital signal processing including the design of multirate filter banks, using the wavelets transforms to efficiently encode signals for compression purposes, spectral analysis and synthesis of signals. Students will apply software tools to analyze, design and simulate multirate digital signal processing systems. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
ECE 581  Arch for Digital Signal Proc  3 Credit Hours
This course introduces the architectural fundamentals and features of programmable digital signal processors. Numeric representations and arithmetic concepts are discussed, which include fixed-point and floating-point representation of numbers, native data word width, and IEE-754 floating-point representation. Memory architecture and memory structures of digital signal processors are examined. Programming concepts for DSP processors such as addressing, instruction set, execution control, pipelining, parallel processing and peripherals are discussed. Finally, students will work on related applications employing digital signal processors such as speech processing, instrumentation, and image processing. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 582  Intro to Statistical DSP  3 Credit Hours
Review of discrete-time signals and systems, introduction of discrete-time random signals and variables, linear signal models, nonparametric power spectrum estimation, least-squares filtering and prediction, signal modeling and parametric spectral estimation, selected topics. (W).
Prerequisite(s): ECE 580*
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering

ECE 583  Artificial Neural Networks  3 Credit Hours
Students will gain an understanding of the language, formalism, and methods of artificial neural networks. The student will learn how to mathematically pose the machine learning problems of function approximation/supervised learning, associative memory and self-organization, and analytically derive some well-known learning rules, including backprop. The course will cover computer simulations of various neural network models and simulations. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 584  Speech Processes  3 Credit Hours
The course introduces the fundamentals of speech processing using digital signal processing methods and techniques. How speech is produced from the human vocal system and the different types of basic speech sound components is addressed, followed by methods to analyze speech signals in both the time domain and frequency domain. Applications of speech processing are also presented. Possible applications covered include speech synthesis, speech coding and speech recognition. A team-based term project may be required. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate

ECE 585  Pattern Recognition  3 Credit Hours
Introduction to pattern recognition (PR) as a process of data analysis. Representation of features in multidimensional space as random vectors. Similarity and dissimilarity measures in feature space. Bayesian decision theory, discriminant functions and supervised learning. Clustering analysis and unsupervised learning. Estimation and learning. Feature extraction and selection. Introduction to interactive techniques in PR. Applications of PR.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 586  Digital Image Processing  3 Credit Hours
Monochrome and color vision in man and machines, image quantization edge detection, image enhancement, image restoration, color analysis and processing, multispectral image processing, texture analysis, image coding and compression, morphology, geometrical image modifications.
Prerequisite(s): ECE 450
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 587  Sel Top:Image Proc/Mach Vision  3 Credit Hours
A special topics course providing an in-depth examination of one or several areas in image processing and/or machine vision. Possible areas include medical imaging, advanced concepts in morphology, stereovision, shape form shading, and active vision.
Prerequisite(s): ECE 586
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 588  Robot Vision  3 Credit Hours
This course introduces important theory and modern technology in robot vision. Representative topics are sensors and image formation, advanced algorithms in object feature filtering, extraction and recognition, texture and colors, motion, 3D vision, and applications. Students cannot receive credit for both ECE 4881 and ECE 588. Three lecture hours per week.
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 589  Multidimen Digital Signal Proc  3 Credit Hours
Topics include multidimensional signal analysis methodologies, signal representation, 2-D FIR filter, 2-D recursive systems and IIR filters, spectral estimation and methods, multidimensional signal restoration applications in 2-D and 3-D image processing, reconstruction, and feature estimation. Three lecture hours per week.
Prerequisite(s): ECE 580
ECE 590 Selected Topics 1 to 3 Credit Hours
Individual or group study, design, or laboratory research in a field of interest to the students. Topics may be chosen from any of the areas of electrical engineering. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 591 Directed Studies 1 to 3 Credit Hours
Special projects for laboratory or library investigation with the intent of developing initiative and resourcefulness. The student will submit a report of the project and give an oral presentation to a panel of faculty members at the close of the term.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 592 Directed Research 1 to 3 Credit Hours
Special problems centered on developing experimental skills. In consultation with a faculty advisor a student will prepare a proposal describing the work to be performed for approval by the department. An oral presentation and a final report on the research effort are required for completion. (F,W,S)

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 5901 Analog IC 3 Credit Hours
****NO DESCRIPTION AVAILABLE****

ECE 610 Wireless Sensor Networks 3 Credit Hours
Advanced data communications, sensor motes, systems architecture and design, wireless communications standards and protocols, routing, security, operating systems, language support, and applications. Three lecture hours per week.

Prerequisite(s): ECE 570

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Mechanical Engineering, Electrical Engineering, Industrial & Systems Engin, Computer & Information Science, Computer Engineering

ECE 612 Humanoids 3 Credit Hours
This course covers advanced technologies in power electronics with emphasis on hybrid vehicle and renewable applications. The course will cover topics such as resonant converters, vector control, field oriented control, battery chargers, vehicle to grid management, power factor correction and harmonic control, model predictive control, renewable energy systems (solar, wind and ocean) and their requirement for power converters, electric drive transportation components, silicon carbide power devices. Three hours per week.

Prerequisite(s): ECE 515

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 615 Advanced Power Electronics 3 Credit Hours
This course covers advanced technologies in power electronics with emphasis on hybrid vehicle and renewable applications. The course will cover topics such as resonant converters, vector control, field oriented control, battery chargers, vehicle to grid management, power factor correction and harmonic control, model predictive control, renewable energy systems (solar, wind and ocean) and their requirement for power converters, electric drive transportation components, silicon carbide power devices. Three hours per week.

Prerequisite(s): ECE 515

Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 642 Robotic Embed Sys 3 Credit Hours
Full Course Title: Robotic Embedded Systems This course covers advanced topics in embedded systems in the context of modern robotics. It is a research-oriented course including a research literature survey, a final project implementing a state-of-the-art algorithm or system, and a set of hands-on assignments that cover modern tools and real-time embedded systems development frameworks such as the Robot Operating System. Lecture and assignment topics include embedded software architectures and modular software frameworks for robotics, modern computer hardware, robot perception and embedded image processing, automatic code generation from higher level modeling languages (such as MATLAB and Simulink), deployment considerations, as well as other selected advanced topics. (YR)

Prerequisite(s): ECE 541 or ECE 542

Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 643 Humanoids 3 Credit Hours
This course covers two major aspects of humanoid robots, locomotion and manipulation. The purpose of this course is to provide students with advanced techniques for generation and control of movement of a humanoid robot itself and its motion to change the environment. Articulated body dynamics, contact modeling, and contact dynamics will be presented first. Locomotion will cover balance control, footstep planning, walking gait generation, joint space trajectory planning, and human motion tracking. Manipulation will include grasping, optimal planning, and dynamic manipulation. Simulation techniques and software will be introduced. This course will include programming and simulation work and students will be required to accomplish a related course project. The course has three lecture hours per week. (W)

Prerequisite(s): ECE 5001 and ECE 540 or ECE 543

Restriction(s):
Can enroll if College is Engineering and Computer Science
ECE 644 Advanced Robotics 3 Credit Hours
This course covers advanced topics related to current research in algorithms and artificial intelligence for robotics such as planning and control issues for robotic systems, taking into account the math and algorithms underneath state-of-the-art robotic systems. The majority of these techniques are heavily based on probabilistic reasoning and optimization-two areas with wide applicability in intelligent robotic systems. Students are expected to have knowledge of high-level programming language and will be required to accomplish a research-related course project. Three lecture hours per week. (W)
Prerequisite(s): (ECE 500 or ECE 5001) and ECE 544
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 645 Coop Robots 3 Credit Hours
This course covers advanced topics related to research in algorithms and methods for robots to cooperate. Topics include cooperation, connectivity, navigation, localization, perception, and control. Students will be expected to read research papers and complete a project with actual robots, e.g., TurtleBots. Three lecture hours per week. (W)
Restriction(s):
Can enroll if Level is Doctorate or Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 646 Adv Elec Drive Transportation 3 Credit Hours
This course gives in depth study in advanced technologies in the electrified vehicle powertrain. The course will cover topics such as hybrid powertrain architectures, dynamics of hybrid transmissions, battery management systems, battery control electronics, PHEV and HEV power management, survivability of military hybrid vehicles, packaging of PHEV electric drive components, optimization of PHEV components, optimization of electric drive efficiency through power management, vehicle to grid technology, emerging technology in electric drive transportation. Three hours per week.
Prerequisite(s): ECE 5462
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 650 Info Theory in Elec Comm 3 Credit Hours
Source models and source coding, channel and channel models, information measure, mutual information and entropy, coding for discrete sources such as variable-length codes and optimum variable-length encoding procedure, discrete memoryless channels and capacity, techniques for coding and decoding such as parity-check codes, cyclic codes, and Hamming codes, quantization and error analysis, coding techniques such as DPCM, run-length coding, sub-band coding, transform coding.
Prerequisite(s): ECE 555

ECE 661 Sys Idnt and Adaptive Control 3 Credit Hours
Minimal state space models, on-line estimation schemes, parameter convergence for SISO and MIMO systems, direct and indirect adaptive prediction, minimum prediction error controllers (one-step ahead and model reference control), minimum prediction error adaptive controllers (direct and indirect approach), adaptive control algorithms for close-loop pole assignment, Kalman filter, extended Kalman filter.
Prerequisite(s): ECE 560

ECE 665 Optimal Control Systems 3 Credit Hours
Parameter optimization; optimization problems for deterministic systems; calculus of variations on optimal control; maximum principle of Pontryagin; dynamic programming; numerical solution of optimal programming and control problems; singular solutions.
Prerequisite(s): ECE 560

ECE 670 Adv Comp Netwk&WL Comm 3 Credit Hours
In depth study of advanced technologies in computer networks and wireless communications. The course will cover topics such as advances in Internet, wireless communications and sensor networks, wireless networked control systems, vehicular networks, smart grid, cloud computing, multimedia networking, and network security. Three lecture hours per week.
Prerequisite(s): (ECE 570 and ECE 5701) or CIS 627
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 675 Computer Architecture II 3 Credit Hours
Prerequisite(s): ECE 575

ECE 679 Adv Intelligent Sys 3 Credit Hours
This is a research seminar on advanced topics in intelligent systems. The course will focus on intelligent systems in solving complex problems. Topics include ensemble techniques, multi-objective optimization, and intelligent agents. The course will require student presentations and a substantial term project. Three lecture hours per week.
Prerequisite(s): ECE 579 or CIS 579
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 681 Adv Digital Sig Processing 3 Credit Hours
Topics include statistical signal processing, multi-rate systems, bank of filter design, multi-resolution formation of wavelet, the discrete wavelet transform, wavelet-based digital signal processing. The course has substantial computer simulation and research project components. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering
ECE 691 Adv Directed Studies 1 to 3 Credit Hours
Advanced Directed Studies for Doctoral Students: Special topic in electrical or computer engineering. A project report and a seminar are required.
Restriction(s):
- Can enroll if Level is Doctorate or
- Can enroll if College is Engineering and Computer Science

ECE 695 Master’s Project 3 Credit Hours
Application of the methodologies, tools and theory of software engineering to produce a specific validated software product. Projects can be faculty-generated, self-generated, and/or work related. All projects must be undertaken with one or more students under the supervision of the instructor. Prior to enrollment, a project proposal must be prepared and approved by the instructor and department chair. Standard software engineering documents must be prepared and approved at each phase of the project, and an oral presentation of the project is required. Course includes lectures and case studies. Permission of instructor required.
Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Level is Rackham or Graduate
- Can enroll if College is Engineering and Computer Science
- Can enroll if Major is Software Engineering

ECE 699 Master’s Thesis 3 or 6 Credit Hours
Graduate students electing the thesis option, working under the general supervision of a member of the department faculty, are expected to plan and carry out the work themselves. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term.
Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Major is Electrical Engineering, Computer Engineering

ESE 500 Sustainable Energy Systems 3 Credit Hours
The course provides an overview of energy technology from a broad perspective that encompasses technical and environmental aspects. It covers a wide range of traditional and alternative energy sources and presents assessments of their availability, sustainability, and environmental impacts as well as evaluation of their potential role in solving the global energy problem. Course work includes project.
Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Level is Rackham or Graduate
- Can enroll if College is Engineering and Computer Science

ESE 501 Energy Conversion 3 Credit Hours
This course covers fundamental engineering principles for converting available energy sources, renewable and nonrenewable, into other energy forms of direct utility. It may include such topics as steam and gas based power plants as well as devices for solar, wind, and hydraulic energy conversion.
Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Level is Rackham or Graduate
- Can enroll if College is Engineering and Computer Science

ESE 502 Energy Storage Systems 3 Credit Hours
This course introduces the basics of energy storage systems for EDV. It will cover battery basics, ultracapacitors, flywheels, and hybrid energy storage concepts. Battery management, battery charging, and battery safety will be covered. Finally, the requirements of EDV and renewable energy application examples will be explained. Lead acid, nickel metal hydride, and lithium ion batteries will be covered. Other energy storage systems such as super conducting magnetic, hydraulic, compressed air, and integrated (hybrid) energy storage systems, will be discussed as well.
Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Level is Rackham or Graduate or or Doctorate
- Can enroll if College is Engineering and Computer Science

ESE 503 Energy Policy, Econ & Environ 3 Credit Hours
This course will give an overview of the current energy and environment policies, their origin and implementation, and the process of developing such policies. It will consider the public policy issues related to alternative and renewable energy systems at both national and international levels. The roles of government, industry and consumers in making these policies will be discussed. The economics of various alternative energies will be considered and trade-offs between them will be discussed from the viewpoint of availability, safety, environmental impact and related issues.
Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if College is Engineering and Computer Science

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
ESE 504  Energy Eval/Risk&Optimization  3 Credit Hours
Formulation of economically efficient strategies and development plans for energy systems requires a sound understanding of energy supply, demand and allocation options as well as the interrelationships between the energy sector, environment, and the economy. Analysis of these energy policy decisions requires evaluation of investment decisions on potential energy projects (and programs) in terms of selected project viability indicators and comparison against a set of decision criteria. This course will provide students the knowledge and skills to identify, analyze, assess, and manage the risks inherent in selecting various energy sources, projects and portfolios of projects. The tools and techniques explored in this class will be applied to energy, environment and resource management policy and investment decisions which are multi-criteria including societal cost and environmental impacts.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

ESE 591  Guided Stud in Energy Systems  1 to 3 Credit Hours
Individual or group study of an energy systems engineering topic of contemporary interest.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

ESE 699  Master's Thesis  3 to 6 Credit Hours
Research for master's thesis under the direction of a faculty adviser.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Engineering Management (EMGT)

EMGT 500  Management for Engineers  3 Credit Hours
This course provides the knowledge, skills, and attitude required to manage an efficient and productive engineering organization within the company, and manage effectively at upper cooperate levels. Topics include: integrating and coordinating people, functions and projects; managing technical resources; leadership and management; strategic planning for integrating and transferring technologies into products and processes; managing innovation, ethical behavior and legal compliance.
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 505  Systems Engineering  3 Credit Hours
Introduction to systems and systems engineering, tools in systems analysis, the system design process, design for operational feasibility and systems engineering management. (College of Engineering and Computer Science).
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 510  Managerial Finance and Econ  2 Credit Hours
This course covers foundation concepts in Financial Management, with emphasis on project evaluation. Topics include financial statement use and analysis, time value of money, valuation of stocks and bonds, capital budgeting and risk/return analysis. (College of Business).
Prerequisite(s): EMGT 540 or EMGT 541
Restriction(s):
Can enroll if Level is Rackham or Graduate
EMGT 515  Corporate Strategy  2 Credit Hours
This course seeks to develop an understanding of the management of technology as a strategic organization resource. Implementation policies are discussed within the context of personal, technological and social frames of values. Strategy topics include: the process of strategy development and integration of technological, functional, and corporate strategies. Implementation policies include organization design, and planning and control at the short-term and longer-term levels. (College of Business).
Prerequisite(s): EMGT 510 and EMGT 535 and (EMGT 541 or EMGT 540)
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 520  Prod & Oper Engineering I  3 Credit Hours
Production and operations management techniques including forecasting, inventory control, MRP, detailed scheduling, aggregate planning, process variability and its effects on throughput and inventory, factory physics principles, and lean methods.
Prerequisite(s): EMGT 505
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 525  Tot Qua Mgmt and Six Sigma  3 Credit Hours
This course covers implementing Total Quality Management (TQM), undertaking Six Sigma Projects, and applying Baldrige National Quality Award criteria and ISO 9000 principles to improve quality performances in an organization. Topics include Definitions and Importance of Quality, Quality Costs, Quality Function Deployment (QFD), Product Specification and Critical-to-quality Measures (COM), Statistical Quality Control (SOC), Robustness Concepts, Quality System Design and Evaluation. Six Sigma and DMAIC Methodologies, Design for Six Sigma (DFSS) process, IDOV (Identity requirements, Deign alternatives, Optimize the design and Verify process capability) Methodology, and several other concepts and tools related to quality are also covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 530  Info Sys for Engin Management  3 Credit Hours
This course covers the organizational foundations of information systems, their emerging strategic role, and the technical foundation for understanding computers and information systems. Topics include: introduction to management information systems; decision support systems; artificial intelligence and expert systems; end-user computing; data vs. information; data communication and connectivity; data management. (College of Engineering and Computer Science).
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 535  Marketing Mgt and Policy  2 Credit Hours
This course studies the salient features of technology-driven marketing and distinguishes technology-push from market-pull marketing. Highlights the technology-marketing interface in the context of strategy planning, market segmentation, product innovation, channels of distribution, promotional and pricing decisions. Particular attention will be paid to technology inventor-user interactions, process of adoption, and technological innovation. (College of Business).
Prerequisite(s): EMGT 510*
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

EMGT 541  Acct Fund for Decision Making  3 Credit Hours
This course introduces fundamental accounting concepts and applications that are useful in the evaluation of financial information and decision tools relevant to project planning. Students will achieve an understanding of basic accounting and cost management tools that are essential to decision making. Emphasis will be placed on assessing financial statement information through an understanding of accounting practice, the relationship between business activities and an organization's cash flows.

EMGT 545  Org Beh and Hum Res Mgt  2 Credit Hours
This course encompasses key areas of human resources management and organization behavior as they relate to technical work environments. Organization design and theory will be discussed, along with motivation, leadership, employee selection skills, group and team processes, and managing diversity. Techniques for devising a personal career development plan are covered. (College of Business).
Prerequisite(s): EMGT 500
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 550  Business Ethics/Law  2 Credit Hours
This course provides students with an overview of the legal environment of business. Concepts including product liability, intellectual property, and contracts are introduced within the context of the legal system. Ethical consideration in personal, professional, and organizational decision making are integrated throughout this course. (College of Business).
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 560  Engin Mgt at Upper Levels  1 Credit Hour
This course provides the knowledge and skills in leadership and management required to build and manage the company's technical resources toward the attainment of corporate objectives. Topics covered include: technological forecasts; corporate strategic planning; corporate portfolios of technical programs; group and strategic planning; project collection; management of institutional time; corporate computer facilities; proposals; introducing new products and processes; inventorying and upgrading; engineering audits; and the role of engineering in joint ventures. (College of Engineering and Computer Science).
Prerequisite(s): EMGT 520 and EMGT 530 and EMGT 545
Restriction(s):
Can enroll if Level is Rackham or Graduate

EMGT 570  Enterprise Information Systems  3 Credit Hours
The purpose of this course is to provide a foundation for the analysis, design and implementation of enterprise information systems. Topics include systems and organization theories, and information systems planning and evaluation. Students will be also introduced to various systems development life cycle phases of an enterprise information system. Students will acquire an understanding of the flow of information (forecasts, financial, accounting and operational data) within an enterprise and the factors that should be considered in designing an integrated enterprise information system. This includes all systems in the business cycle from revenue forecasts, production planning, inventory management, logistics, manufacturing, accounts payable, sales, accounts receivable, payroll, general ledger and report generation. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (F,W)
EMGT 580  Mgt of Prod and Proc Design  3 Credit Hours
This course provides the knowledge and skills needed to manage the design of a product or process. Topics covered include: creativity, types of products, types of processes, generalized design process, identification and translation of customer needs into engineering specifications, designing for function and quality factors, design for manufacturability, life-testing, cost estimating, reporting on design projects, and concurrent engineering. (College of Engineering and Computer Science).
Prerequisite(s): EMGT 520 and EMGT 525 and ACC 505
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

EMGT 590  Capstone Project  3 Credit Hours
Students will receive the opportunity and training to integrate and apply both the technical and program management aspects acquired in various courses to an engineering project or problem.
Prerequisite(s): IMSE 5215 and IMSE 5205 and IMSE 517
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Program & Project Management

EMGT 591  Capstone Project in EMGT  2 Credit Hours
Students will receive the opportunity and training to integrate and apply both technical and managerial aspects acquired in various courses to an engineering project or problem.
Prerequisite(s): EMGT 580 and EMGT 500 and EMGT 570
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Program is MS-Engineering Management

EMGT 699  Master's Thesis  1 to 6 Credit Hours
Graduate students electing this course, while working under the general supervision of a member of the program faculty, are expected to plan and conduct the work themselves, to submit a thesis for review and approval, and to present an oral defense of the thesis.
Restriction(s):
Can enroll if Level is Rackham or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
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English (ENGL)

ENGL 508  Shakespeare I: Earlier Works  3 Credit Hours
Intensive study of selected works from the first half of Shakespeare's career, designed to increase the student's critical appreciation and understanding. Students cannot receive credit for both ENGL 408 and ENGL 508.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250)
Restriction(s):
Can enroll if Class is Graduate

ENGL 509  Shakespeare II: Later Works  3 Credit Hours
Intensive study of selected works from the second half of Shakespeare's career, designed to increase the student's critical appreciation and understanding. Student cannot receive credit for both ENGL 409 and ENGL 509.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250)
Restriction(s):
Can enroll if Class is Graduate

ENGL 513  Shakespeare's Contemporaries  3 Credit Hours
An examination of the performance and cultural contexts of plays by English Renaissance playwrights (Marlowe, Middleton, Webster, Jonson, etc.), working around the time of Shakespeare. A limited number of Shakespeare's plays may be included.
Prerequisite(s): (COMP 106 or COMP 220 or COMP 280 or COMP 270 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Can enroll if Class is Graduate

ENGL 520  Maj Engl 18th-Century Authors  2 to 3 Credit Hours
An intensive study of two or three authors, such as Dryden, Behn, Pope, Swift, Burney, Austen, or Samuel Johnson. Students cannot receive credit for both ENGL 420 and ENGL 520.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 524  18th-Century English Novel  3 Credit Hours
A study of the rise and development of the English novel during the 18th Century. Consideration is given to such novelists as Defoe, Richardson, Fielding, Sterne, Austen, and Smollett. Students cannot receive credit for both ENGL 424 and ENGL 524.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 540  Maj Engl/Amer 20th-Cent Author  3 Credit Hours
An intensive examination of the works of representative English and American authors since 1900. Students cannot receive credit for both ENGL 440 and ENGL 540.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

English (ENGL)
ENGL 541 Major 20C/21C English Authors 3 Credit Hours
An intensive study of several modern English authors, such as Shaw, Joyce, Forster, Dylan Thomas, D.H. Lawrence, and Woolf. Students cannot receive credit for both ENGL 441 and ENGL 541.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Can enroll if Class is Graduate

ENGL 542 Studies in 20-21 Century Lit 3 Credit Hours
Intensive study of a special topic in 20th- or 21st-century literatures in English. The course may treat a single author (e.g. E.M. Forster), a movement (e.g. Postmodernism) a genre (e.g. modern short story), or a theme (e.g. Literature of World War).
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 545 20C/21C Women Authors 3 Credit Hours
An analysis of selected works of significant and emerging 20th and 21st century women authors writing in English, with special emphasis on issues of gender and social and cultural identity. Additional assignments will distinguish this course from its undergraduate version.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 550 Maj Amer Auth to the Civil War 3 Credit Hours
An intensive study of two or three major authors from the period between the Civil War and World War I, such as Emily Dickinson, Charles Chesnutt, or Henry James. Students cannot receive credit for both ENGL 451 and ENGL 551.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 551 Maj Am Auth: Civ War to WWI 3 Credit Hours
An intensive study of two or three major authors from the period between the Civil War and World War I to the present, such as Langston Hughes, Frost, Hemingway, and Faulkner. Students cannot receive credit for both ENGL 452 and ENGL 552.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 552 Major 20C/21C American Authors 3 Credit Hours
An intensive study of several Modern American authors from World War I to the present, such as Langston Hughes, Frost, Hemingway, and Faulkner. Students cannot receive credit for both ENGL 452 and ENGL 552.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 553 Contemporary American Novel 3 Credit Hours
Study of selected American novels and novelists since WWII with an eye to their social, political, and literary contexts. Course will focus on major works by major authors and representative works by lesser-known writers in order to explore technical, thematic, and critical crosscurrents among the works. Students cannot receive credit for both ENGL 453 and ENGL 553.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 554 Postmodern Literature 3 Credit Hours
This course explores the expression of postmodernism in literature (primarily fiction) and critical theory. Selected works of fiction and creative non-fiction will be analyzed in terms of the problems and issues raised by the postmodern movement. Students cannot receive credit for both ENGL 454 and ENGL 554.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

ENGL 555 Modern English Grammar 3 Credit Hours
The morphological and syntactic analysis of the structure of present day English considered in the light of modern linguistic science. Students cannot receive credit for both ENGL 461 and ENGL 556.
Prerequisite(s): LING 280 or LING 480 or LING 580
Restriction(s):
Can enroll if Class is Graduate

ENGL 556 Writing Young Adult Fiction 3 Credit Hours
In this course participants will explore the young adult novel form the point-of-view of a reader and a writer. They will read recently published and critically acclaimed popular young adult novels. They will use these texts to explore such issues as gender, race and identity as they relate to young adult lives and their respective cultures generally. They will use these texts as models for the production of their own texts and will consider the constraints and benefits of constructing and writing to a particular audience. They will consider if and why young adult novels are abbreviated or limited in relationship to adult literature. In addition to reading about ten novels, they will complete several creative exercises leading up to a final portfolio. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students will not receive credit for both ENGL 468 and ENGL 568.
Restriction(s):
Can enroll if Class is Graduate
ENGL 569 Contemp African American Lit  3 Credit Hours
An intensive study of major 20th century African American writers. Fiction, poetry, autobiography, and drama will be examined, but one genre will be stressed in any given term, e.g., the novel. Lectures will provide historical and biographical context for analysis and discussion of the works. (OC).
Prerequisite(s): (COMP 106 or COMP 220 or COMP 270 or COMP 280 or Composition Placement Score with a score of 40) and (ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s): Can enroll if Class is Graduate

ENGL 571 LGBTQ Literature  3 Credit Hours
This course surveys primarily contemporary literature by writers who identify as gay, lesbian, bi-sexual, transgender, or queer. By studying the self-representation and culturally unique perspective of this emerging canon of writers, students in this course understand the emergence of LGBTQ literary traditions and understand the cultural diversity within these traditions. Students learn to identify the aesthetic qualities (such as camp, performativity, coded subtexts, homoeroticism, and the relationship between creativity and sexuality), and historical, political, and social concerns that characterize LGBTQ literary and cultural production. Topics covered include the struggle for civil rights before and after Stonewall, coming out narratives, the negotiation of homophobic cultures, post-colonial writers, and memoirs of the LGBTQ experience, as well as the historical emergence of sexual categories and the literary critique of heteronormativity. This course counts toward the English discipline diversity requirement.
Restriction(s): Can enroll if Class is Graduate

ENGL 572 Readings in Muticult Contexts  3 Credit Hours
An examination of the effect of different cultural backgrounds on reading and literature. Topics include contrastive rhetoric, folk narrative, and multicultural juvenile literature. This course does not satisfy requirements for the English concentration. Not open to English concentrators. (YR)
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s): Can enroll if Class is Graduate

ENGL 573 Arab American Women Writers  3 Credit Hours
This course examines the literary and cultural contributions of Arab and Arab American women novelists, poets, filmmaker and artists to the development and consolidation of cultures of understanding and coexistence; explores the relations between, among others, citizenship and belonging, race and national security, gender and geographical mobility, and ethnic minorities and mainstream consciousness; stresses how literary and artistic productions of Arab and Arab American women writers and artists foster alternative visions of socio-cultural coexistence, dialogue, and hospitality by means of technical and stylistic experimentation and renovation.

ENGL 572 Readings in Muticult Contexts  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between “nature” and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th and 20th centuries, but assigned materials may include reading from other cultures and historical periods.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s): Can enroll if Class is Graduate

ENGL 582 History of the English Lang  3 Credit Hours
A thorough grounding in the history and structure of the English language. At issue are the linguistic and ideological origins of Standard English, and the strengths and limitations of different methods of analyzing the history of the language. The course will emphasize sound change, grammatical change, and their sociolinguistic context. (YR)
Prerequisite(s): LING 480 or LING 580
Restriction(s): Can enroll if Class is Graduate

ENGL 588 Env Lit & Reps of Nature  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between “nature” and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th and 20th centuries, but assigned materials may include reading from other cultures and historical periods.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s): Can enroll if Class is Graduate

ENGL 590 Topics in English  1 to 3 Credit Hours
Examination of problems and issues in selected areas of English. Titles listed in the Schedule of Classes will change according to content. Course may be repeated for credit when specific topic differs. Only offered for graduate credit. (OC).
Restriction(s): Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

English Composition (COMP)

COMP 564 Contemporary Rhetorical Theory  3 Credit Hours
An examination of contemporary rhetorical theories through study of representative practitioners and related developments in linguistics, philosophy, psychology, communication, and composition and rhetoric. Additional work will distinguish this course from its undergraduate version. Students may not receive credit for both COMP 464 and COMP 564.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
ENT 626  Intro to Entrepreneurship  3 Credit Hours
This course focuses on the process of new enterprise creation. It will examine how the interplay of personal and group creativity and market demand provides a basis for the conception, design, and launch of new ventures. Although a variety of business options will be considered, emphasis will be placed on the creation of technology-driven growth enterprises. The course content will familiarize students with the tasks of capital formation, business planning, staffing, systems design, and operations management in the entrepreneurial context. Students taking the course should have an interest in creating a new firm or initiating an entrepreneurial venture within a larger organization. All students will develop a plan for their venture.
Restriction(s):
Can enroll if Class is Graduate

ENT 627  Manag the Entrepreneurial Firm  3 Credit Hours
This course addresses the issues of managing an existing enterprise. It gives special emphasis to the challenges associated with growth and maturation of the firm. These include second round and mezzanine financing, market penetration and new market entry, expanding the product lines, building the management team, formulating operating policies and procedures, strengthening the firm's competitive position and establishing market entry barriers, and creating harvest options.
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Environmental Science (ESCI)

ESCI 504  Field Studies in Env Science  2 Credit Hours
A systematic analysis of the environment. This course will focus on the analysis of the Rouge River Watershed as an ecological unit. The student will make intensive analyses of the river water and the surrounding land surface at selected sites. The results will provide a composite of the water quality and land use of the various tributaries. Emphasis will be placed on proper sampling and testing techniques, field and lab safety procedures, aquatic chemistry, biological organisms as indicators of pollution, and the role of wastewater dumping on the watershed.

ESCI 525  Soil in the Environment  3 Credit Hours
The study of soil in the environment, including its formation, classification, physical attributes and engineering properties with an emphasis on soil-water statics and dynamics, chemical attributes and processes. Students are expected to have background knowledge of physical geology. The course will include field trips and field work, including the collection of soil samples from the Universities natural area. The course will also include a laboratory component in which students will perform a variety of test, e.g. bulk density, engineering properties on the soil samples collected. The course will typically be team taught. (S, AY)
Prerequisite(s): GEOL 118
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

ESCI 572  Environmental Communications  3 Credit Hours
Preparation and presentation of both oral and written technical abstracts and reports, including environmental newsletters, thesis, and media releases. Professional scientists must be able to effectively communicate ideas and concepts to other scientists and to the general public. This course will provide the foundations in learning how to communicate ideas effectively and succinctly. (F, YR)
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if College is Arts, Sciences, and Letters
ESCI 574  Watershed Analysis  3 Credit Hours
An interdisciplinary study of watersheds, the most commonly used bioregional unit. The course integrates the analysis of many factors which contribute to the character of watersheds, including bedrock and surficial geology, surface and groundwater hydrology, social history, land use history, water quality analysis, biological diversity, laws and regulations, management models, drinking water and wastewater systems, best management practices, and educational programs. The Rouge River watershed will serve as the primary case study.
Restriction(s):
Can enroll if Class is Graduate

ESCI 585  Spatial Analysis and GIS  3 Credit Hours
Application of the principles of Spatial Analysis and the use of Geographic Information Systems as a research tool in Environmental Science. Emphasis will be placed on the use of commercially available software including: ESRI's ArcView GIS, Golden Software’s Surfer and Adobe PhotoShop. Emphasis will also be placed on the use of the Michigan spatial data warehouse program and the Michigan geographic framework program for metadata specific to Michigan. (AY).
Restriction(s):
Can enroll if Class is Graduate

ESCI 595  Topics in Environmental Science  3 Credit Hours
Problems or readings on specific topics or subjects in environmental science. (YR)
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if College is Arts, Sciences, and Letters

ESCI 595G  Topics in Environmental Science  3 Credit Hours
Topics: Soil in the Environment. A study of the textural and chemical classification of soil as well as the biologic, engineering and geologic aspects of soil science including applications to agriculture and agronomic science. The course will explore topics such as soil formation, soil-water statics and dynamics, soil-energy balances, soil fertility and plant nutrition, biodiversity, soil and water management, soil pollution and remediation.

ESCI 597  Off-Campus Independent Study  1 to 3 Credit Hours
Provides opportunity for qualified graduate students in the MSES program to pursue independent research under the direction of a graduate faculty member off campus. A written proposal describing the project (including the nature of the project itself, dates, where the project will be done and the faculty member supervising the project) must be approved by the MSES program director/committee before the student can register for the course. Project must be appropriate to the student’s chosen track. It must be designed to produce a scholarly paper, papers, or other evidence(s) that reflect significant results from the course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ESCI 599  On-Campus Independent Study  1 to 3 Credit Hours
Provides opportunity for qualified graduate students in the MSES program to pursue independent research under the direction of a graduate faculty member. A written proposal describing the project (including the nature of the project itself, dates, and the supervising faculty member) must be submitted to the Program Director/committee for approval before the student can register for the course. Project must be appropriate to the student’s chosen track. It must be designed to produce a scholarly paper, papers, or other evidence(s) that reflect significant results from the course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ESCI 698  MSES Master’s Project  3 Credit Hours
Intended for students who present a plan for a project using methods of intellectual exploration and analysis. Possible projects include gathering data through laboratory or field based studies, using interviews and survey instruments to gauge human responses. They should involve creative representations, writing, and other forms of interdisciplinary analysis. To be carried out under the general supervision of a member of the graduate faculty in Natural Sciences. Project plan must be approved by the MSES Program Director/committee before student registers for this course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ESCI 699  MSES Master’s Thesis  1 to 6 Credit Hours
MSES students electing this thesis option in the last stage of the program will work under the general supervision of a member of the graduate faculty in Natural Sciences, but will plan and carry out the work independently. Prospectus and thesis plan must be approved by the MSES Program Director/committee before student registers for this course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Environmental Studies (ENST)

ENST 574  Environmental Education  3 Credit Hours
This course involves an in-depth analysis of the environmental education at both the elementary and secondary school level, particularly stressing the environment as a teaching resource. Community resources as they related to environmental education are also investigated. Graduate students will be expected to become knowledgeable about and complete a review of current research that involves the efficacy of environmental education.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

ENST 588  Env Lit & Reps of Nature  3 Credit Hours
An interdisciplinary study of the ways in which the relationship between "nature" and humankind has been represented in literature and other forms of cultural expression. Emphasis on American and British texts of the 19th and 20th centuries, but assigned materials may include readings from other cultures and historical periods.
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 270) and (ENGL 230 or ENGL 200 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239)
Restriction(s):
Can enroll if Class is Graduate

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Frequency of Offering
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Exploratory Studies (EXPS)

EXPS 500 STEM2 Teaching and Learning 3 Credit Hours
The content of this course and the pedagogy employed will provide students with experiences in topics related to the integration of science, technology, engineering, and mathematics (STEM2). Students will experience examples of STEM activities and will explore how STEM2 disciplines impact society. (YR)
Restriction(s):
Can enroll if Class is Graduate

EXPS 507 Inquiry-based Math and Science 3 Credit Hours
This inquiry-based laboratory course intends to support the learning of early childhood educators (birth to grade 2) in foundations of science and mathematics. The course integrates concepts and processes that arise in both disciplines, such as classification; units and measurements; shapes and structures and their properties; patterns; problem solving; representation; cause and effect; use of evidence (three credits). Required for Early Childhood Comprehensive Major. Elective for Elementary Education Certification Students. Students cannot receive credit for both EXPS 407 and 507. Students seeking graduate credit should elect EXPS 507. The required lab fee is to cover course materials.
Restriction(s):
Can enroll if Class is Graduate

EXPS 515 Evolution for Teachers 1 to 3 Credit Hours
Course is designed to meet the needs of grade K-12 teachers teaching about evolution. The Michigan Department of Education requires students to be able to explain how scientists construct and scientifically test theories concerning the origin of life and evolution of species.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

EXPS 520 Science Ed Action Research 3 Credit Hours
This is the culminating course that integrates prior experiences in the MSSE program. Each student will identify a research question related to his/her own classroom practice, review relevant literature, collect and analyze data, and complete a scholarly report.
Prerequisite(s): EDK 500
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services
Can enroll if Major is Environmental Science, Science Education, Education

EXPS 543 Family/School/Community Collab 2 Credit Hours
Characteristics, roles, and functions of contemporary families are described. Various communication and training strategies designed to promote collaboration and teamwork within and between the school staff, the families, and community are described and practiced through discussion, problem-solving activities, and roleplaying. Family effectiveness assessment instruments and strategies are also described and practiced.
Restriction(s):
Can enroll if Class is Graduate

EXPS 593 Simulation and Gaming 1 to 3 Credit Hours
This course focuses on simulation and gaming as approaches to learning which are fundamentally different from methods traditionally used in education, industry, business, and psychology. Students will have the opportunity to examine many different types of simulations and games and to participate in selected ones. They will also be able to design one for use in their own area of interest.
Restriction(s):
Can enroll if Class is Graduate

EXPS 598 Exploring Writing/Child&Yng Ad 3 Credit Hours
This course provides a theoretical foundation for writing instruction of children/adolescents in grades K-8. Emphasis is placed on modeling, instructional strategies, and assessment for supporting student writers that pre-service and in-service teachers can use to facilitate students' development of written language across various genres. TB clearance, criminal background check, and bloodborne pathogens/infectious diseases training required.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

EXPS 599 Individ Res in Lit in Educatio 1 to 3 Credit Hours
Requires the student to initiate, and carry to completion, a literature in education based research project under the supervision of a faculty member. May be elected more than once for a total of not more than three credits as approved by advisor.
Restriction(s):
Can enroll if Class is Graduate

EXPS 620 Action Research 3 Credit Hours
Students will learn about action research as a means to become a reflective practitioner to make improvements in an educational setting. Students will identify a research question related to his/her own professional practice, review relevant literature, collect and analyze data, develop and implement an action plan, and complete a scholarly report.
Prerequisite(s): EDK 500
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Graduate
Can enroll if College is Education, Health, and Human Services

EXPS 715 Evolution for Teachers 3 Credit Hours
Course is designed to meet the needs of grade K-12 teachers teaching about evolution. The Michigan Department of Education requires students to be able explain how scientists construct and scientifically test theories concerning the origin of life and evolution of species.
Restriction(s):
Can enroll if Class is Specialist or Doctorate
EXPS 720  Science Ed Action Research  3 Credit Hours
This is the culminating course that integrates prior experiences in the MSSE program. Each student will identify a research question related to his/her own classroom practice, review relevant literature, collect and analyze data, and complete a scholarly report.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EXPS 799  Ind. Res. in Lit in Education  1 to 3 Credit Hours
Requires the student to initiate, and carry to completion, a literature in education based research project under the supervision of a faculty member. May be elected more than once for a total of not more than three credits as approved by advisor.

Restriction(s):
Can enroll if Class is Specialist or Doctorate

EXPS 820  Action Research  3 Credit Hours
Students will learn about action research as a means to become a reflective practitioner to make improvements in an educational setting. Students will identify a research question related to his/her own professional practice, review relevant literature, collect and analyze data, develop and implement an action plan, and complete a scholarly report.

Prerequisite(s):
EDK 500 or EDK 700

Other Content

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Frequency of Offering

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* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Finance (FIN)

FIN 531  Fin Fundament & Value Creation  3 Credit Hours
This course provides the fundamentals of the finance discipline with an emphasis of value creation as the primary objective of a corporation. Capital budgeting analysis and techniques are extensively discussed. Valuation of securities is presented along with an introduction to modern portfolio theory and market efficiency. Issues related to international financial management are also introduced.

Prerequisite(s):
(�Mathematics Placement with a score of 105 or MATH 104 or MATH 105 or MATH 113 or MATH 115) and (�DS 520* or IMSE 514*) and ACC 505

Restriction(s):
Can enroll if Class is Graduate

FIN 581  Topics in Corporate Finance  3 Credit Hours
This course integrates theory and practice for major topics such as capital structure and dividend policy. Additional topics include leasing, corporate governance, mergers and acquisitions, short-term financial management, and risk management. These topics are examined from the perspective of the corporate financial manager.

Prerequisite(s):
FIN 531 and BE 530* and ACC 505 and (�DS 520 or IMSE 514)

FIN 650  Corporate Valuation & Strategy  3 Credit Hours
This course examines a variety of financial management topics, such as project and enterprise valuation and risk analysis, corporate restructuring, dividend policy, corporate governance, and current asset management using case studies and readings.

Prerequisite(s):
FIN 581 and BE 530

FIN 651  Invstmnt Proc, Analysis & Mgmt  3 Credit Hours
This course provides an examination of the process of investment analysis and management. Topics include: analysis of fixed income securities, stock valuation, and introduction to derivative securities; discussion of portfolio theory and management; and an overview of investment environment. Wherever it is appropriate, the above topics will also be discussed in a global context.

Prerequisite(s):
ACC 505 and FIN 531 and (�DS 520* or IMSE 514*)

Restriction(s):
Can enroll if Class is Graduate

FIN 652  Derivatives & Risk Management  3 Credit Hours
The focus of this course is on understanding the derivative securities and their use in risk management. This course provides an in-depth introduction to options and option pricing as well as an extensive overview of forward, future and swap contracts. This course will draw upon the intuition and analytic tools developed to examine sophisticated financial products or strategies that firms and investors have used in their risk management.

Prerequisite(s):
FIN 531 and ACC 505 and (�DS 520* or IMSE 514)

Restriction(s):
Can enroll if Class is Graduate

FIN 653  Topics/Investments & Cap Mkts  3 Credit Hours
This course prepares students for career development and advancement in the challenging investment profession. The course provides an in-depth study of advanced contemporary topics in global investments and capital markets that are selected from the common body of knowledge of the Chartered Financial Analysts (CFA) program. Topics may include: advanced investment theory and valuation techniques, asset allocation, behavioral finance, hedge fund, emerging markets and global investing, ethics for investment professionals, financial statements and security analysis, market efficiency, market microstructure, portfolio management and performance evaluation, etc. The format and the topics may vary in each offering.

Prerequisite(s):
FIN 651 and (�DS 520 or IMSE 514)

Restriction(s):
Can enroll if Class is Graduate
FIN 457 and FIN 657 of undergraduate students. (F,W,OC) Students cannot receive credit for these courses if they have already completed FIN 456 or FIN 656.

FIN 456* and ACC 505 and (DS 520 or IMSE 514)

FIN 655 International Financial Mgt 3 Credit Hours
This course views international finance at the micro level, but of necessity it will cover some aspects of macro-level international finance as well, such as the international financial system and balance of payments mechanism. The following topics will be covered: the international financial system, balance of payments, foreign exchange, exchange risk management, international financial markets, foreign investment, and foreign trade financing.

Prerequisite(s): FIN 531 and ACC 505 and BE 530 and (DS 520 or IMSE 514)

FIN 656 Fixed Income Securities 3 Credit Hours
The fixed income market, accompanied by the introduction of sophisticated financial engineering techniques, has grown enormously over the last two decades. Today, the fixed income market has been a vital segment of the global financial market. This course covers major topics associated with this market, including bond pricing, yields, and volatility; term structure of interest rates and yield curve; market structure and analytical techniques for Treasury, municipal, corporate bonds, mortgage-backed securities, asset-backed securities, and bond with embedded options. The fundamental objective of this course is to help students develop analytical skills for pricing fixed income securities and managing interest rate risk. In addition, materials covered in this course are compatible with the Common Body of Knowledge in Analysis of Debt Investments that is required by the Chartered Financial Analysts (CFA) examination. Students will not receive credit for both FIN 456 and FIN 656.

Prerequisite(s): (MATH 113 or MATH 115 or Mathematics Placement with a score of 116) and FIN 651* and (FIN 581 or FIN 652 or FIN 654 or FIN 655)

Restriction(s):
Can enroll if Class is Graduate

FIN 657 Investment Fund Management 3 Credit Hours
This course introduces finance students to investing approaches and analytical techniques including both Intrinsic and Relativistic analyses used for security analysis employed and implemented by professional money managers. The course is recommended for finance students seeking to develop careers related to money management, investment analysis, financial analysis, portfolio management and related financial services careers. The main focus of the course is to gain the experience and skills of equity securities analyses through the Student Managed Investment Fund. The course requires application of fundamental and intrinsic equity analyses valuation. Graduate students are required to analyze data at a more advanced level than that required of undergraduate students. (FW,OC) Students cannot receive credit for both FIN 457 and FIN 657.

Prerequisite(s): FIN 407 or FIN 651

* An asterisk denotes that a course may be taken concurrently.

Geology (GEOL)

GEOL 450 Glacial Geology 3 Credit Hours
The study of landforms and sediments created by glaciers both past and present. The glacial activities of the past 2 million years will be emphasized, particularly the evolution of landforms common to the upper Midwest. The influence of glacial deposits on development, construction methods, planning and environmental protection will also be discussed.

Prerequisite(s): GEOL 118 and GEOL 218

Restriction(s):
Can enroll if Class is Graduate

GEOL 550 Engineering Geology 3 Credit Hours
The application of structural geology and stratigraphy to the practice of civil engineering. Emphasis is placed on the application of geologic analysis to facilitate the successful completion of engineering projects. Case histories will be used to evaluate how geologic knowledge has been used in both successful and unsuccessful engineering projects. (W, AY)

Prerequisite(s): GEOL 370

Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior

GEOL 551 Geochemistry 3 Credit Hours
Application of the principles and techniques of geochemistry to the field of groundwater hydrology. Composition of natural water and the processes affecting the geochemical mobility of dissolved solids will be studied. Emphasis will be on the influence of the geochemical environment on water composition and water pollution. Course will include a review of analytical methods for the determination of water quality. Three hours lecture. (AY).

Prerequisite(s): GEOL 375 and CHEM 344

Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Business

GEOL 557 Urban Watersheds 3 Credit Hours
Study of the geology, contamination and sustainable development in urban watersheds with a focus on the fate and transport of contaminants in the soil and water. Students are expected to have a rudimentary background in physical geology.

GEOL 558 Contaminant Hydrogeology 3 Credit Hours
Advanced lecture treatment of selected topics in subsurface hydrology including contaminant transport and fate of organic and inorganic constituents, aquifer test analysis, and the use of selected case histories. (AY)

Prerequisite(s): GEOL 375

Restriction(s):
Can enroll if Class is Graduate

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**German (GER)**

**GER 599  Advanced Individual Projects  1 to 4 Credit Hours**
Advanced individual study project in German language, literature, or civilization may be pursued under the direction of a faculty supervisor. (OC).

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

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**Health and Human Service (HHS)**

**HHS 501  HHS Internship  3 Credit Hours**
The Health and Human Services Internship is an academic, curriculum-based practical work experience in a health care setting, health insurance firm, or health policy agency that provides students with hands-on experience to enhance understanding of issues relevant to health policy and health service delivery. Internship is normally unpaid and when taken as a three credit hour course, consists of 8 hours per week of field work over a 14-week semester. Students are required to attend an internship seminar that meets weekly and includes a series of lectures on organizational, ethical, and administrative topics, intended to link the work experience with students prior coursework. (F,W,S)  
**Restriction(s):** Can enroll if Level is Graduate

**HHS 503  Medical Information Systems  3 Credit Hours**
Medical Information Systems deals with how information is created, stored and used in health care settings. Areas to interest for this course include fundamentals of computers and data management, medical information documentation in the form of paper and electronic medical records, health data privacy issues, disease classification and scoring systems, quality assurance in health care delivery, commonly used health care statistics, reimbursement methodologies, health care monitoring by internal processes and external review agencies, and vital statistics and disease surveillance systems. The course also includes some hands-on computer applications instruction to familiarize students with commonly used software platforms utilized in health care administration. Students cannot receive credit for both HHS 403 or HPS 403 and HHS 503 or HPS 503. (F,W,S)  
**Prerequisite(s):** HHS 440 or HHS 540 or HPS 440 or HPS 540  
**Restriction(s):** Can enroll if Level is Graduate

**HHS 504  Financing Health & Medical Sys  3 Credit Hours**
Full Course Title: Financing Health & Medical Systems The American health care system faces two problems: access to health services and high and rising costs. This course looks at the problems of uninsured citizens as well as the strains placed on health care facilities in providing services for them. Europeans have dealt with problems of access and costs controls through universal health care coverage and the course takes up various models in use today. The course also looks at American health insurance and "managed care" programs such as HMOs and PPOs as methods of providing health coverage as well as controlling costs. The course introduces students to services provided by the government including Medicare, Medicaid and State Children's Health Insurance Program (SCHIP). Students will learn the basics of creating a budget under constraints such as contractual limitations and Diagnosis-Related Groups (DRGs). Students Cannot receive credit for more than one of the following: HHS 404, HPS 404, HHS 504, or HPS 504. (F,W,S)  
**Restriction(s):** Can enroll if Level is Graduate
HHS 506  Program Evaluation  3 Credit Hours
This course will provide an introduction to key concepts in program evaluation. Students will learn about the systematic steps involved in evaluating public programs for efficiency and effectiveness. The course will rely on case studies, text examples and discussion. This course is the graduate equivalent of HHS 406. Graduate students enrolled in this course will produce a paper that is substantially different with increased requirements than the paper produced by undergraduates enrolled in HHS 406. In addition, graduate student examinations will require deeper responses that focus on synthesizing both text and journal article materials. (OC)
Restriction(s):
Can enroll if Class is Graduate

HHS 510  Quantitative Research & Stats  4 Credit Hours
An introduction to methods of data collection and analysis. Also a discussion of research design and the philosophy of social sciences. Additional reading assignments or projects will distinguish this course from its undergraduate version HHS 410. Students cannot receive credit for both HHS 410 and HHS 510. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Graduate

HHS 512  Principles of Epidemiology  3 Credit Hours
The study of frequency and distribution, as well as the causes and control, of disease in human populations. Using data analysis tools, one can identify causes of disease and the effects of prevention and treatment. This course is an application of research design to determine the extent to which environment (toxins, for instance), heredity, childhood, development, and lifestyle influence morbidity and morality rates. Graduate students' work will include re-analyzing original data in a confirmatory, in contrast to exploratory mode. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 515  Healthcare Administration  3 Credit Hours
This course introduces students to administrative models and skills that can be used at a supervisory level. These conceptions include strategic planning, marketing, organizational communications, quality assurance, project management and team skills, supervision and evaluation, conflict resolution and office cultures and politics. A critical and historical perspective is used to understand the origins and meanings of these conceptions and the extent to which they correspond with the service mentality of health and human services. Applications to the health and human services will be central to the course. Students cannot receive credit for both HHS 415 or HPS 405 and HHS 515 or HPS 505. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 530  Health Behavior & Health Educ  3 Credit Hours
Full Course Title: Health Behavior & Health Education This course provides an overview of social and behavioral science theories that guide the development of health education and promotion interventions aimed at preventing, reducing, and eliminating public health problems. Part one of the course describes the relationship between behavior and health, through a review of several current health problems faced by people in the United States. Part two presents a survey of health behavior theories ranging from those aimed at individual behavioral change to community health education promotions. The final part of the course looks at the application of theory to real-world health promotion and education interventions. Students will learn how social and behavioral theory informs intervention design, implementation, and evaluation. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

HHS 533  Race/Ethnic Health  3 Credit Hours
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequity—race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy. (OC)

HHS 540  Medical Sociology  3 Credit Hours
An analysis of health and illness behaviors from the point of view of the consumer, as well as the medical professionals, the structure, strengths, and weaknesses of the medical care delivery system in the U.S; the impact of culture and personality on illness behavior; and a study of the institution of medicine and activities of health care professionals. Additional reading assignments or projects will distinguish this course from its undergraduate version HHS 440. Students cannot receive credit for both HHS 440 or HPS 440 and HHS 540 or HPS 540. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Level is Graduate

HHS 542  Medical Ethics  3 Credit Hours
Issues in medical ethics are among the most urgent facing the world today. This course will explore some of these issues, the relationship between patient and health caregiver (truth-telling, informed consent, the right to refuse treatment, confidentiality); assisted suicide and euthanasia; treatment of defective newborns; scarce resources, social justice and the right to health care; cloning and genetic manipulation; new reproductive technologies; and others. We will discuss issues from the standpoint of patients, medical stressed. Students cannot receive credit for both HHS 442 or HPS 442 and HHS 542 or HPS 542. Prerequisite: any previous course in Philosophy or permission of instructor. (F,W,S)
Prerequisite(s): PHIL 100 or PHIL 120 or PHIL 233 or PHIL 234 or PHIL 240 or PHIL 301 or PHIL 303 or PHIL 304 or PHIL 305 or PHIL 310 or PHIL 315 or PHIL 320 or PHIL 340 or PHIL 350 or PHIL 355 or PHIL 365 or PHIL 369 or PHIL 370 or PHIL 371 or PHIL 375
Restriction(s):
Can enroll if Level is Graduate
HHS 548  Comparative Health Care Sys  3 Credit Hours
An introduction and overview of the English, Swedish, and People's Republic of China health care systems. Focus on cultural and other organizational characteristics, unique features, approaches and ability to solve problems. Emphasis on how the three systems help us understand the American health care system. Additional reading assignments or projects will distinguish this course from its undergraduate version. HHS 448 or HPS 448 and HHS 548 or HPS 548. (F,W,S)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Cannot enroll if Level is Graduate

HHS 556  Health Care and the Law  3 Credit Hours
A sociological study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children's rights, access to health care. The emphasis will be on the organizational and personal consequences of legal requirements. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both HHS 456 or HPS 456 and HHS 556 or HPS 556. (F,S,W)
Prerequisite(s): SOC 200 or SOC 201 or POL 364
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate

HHS 570  Data Science and Ethics  3 Credit Hours
Technological innovations in how individuals, organizations, and governments collect and share personal information have raised myriad concerns regarding how that information can be best protected. In today's highly networked world, individuals must acquire the knowledge and skills to engage with technologies in a safe and secure manor. This course provides an interdisciplinary exploration of the social, legal, ethical, and design challenges that arise when it comes to securing personal information and helping individuals maintain desired levels of privacy at home, work, and everywhere in between. Graduate students interact with a local agency and produce a paper regarding a relevant security issue. Students may not receive credit for both HHS 470 and HHS 570. (OC)
Prerequisite(s): MATH 115 and MATH 116 and (MATH 227 or MATH 217) and (MATH 205 or MATH 215) and CIS 150 and MATH 200 or CIS 200 or ECE 200

HHS 591  Graduate Seminar  3 Credit Hours
Seminar focuses on current issues and practical problems in health care organization, delivery, and financing. The Case Method (where appropriate) is used to demonstrate and discuss real problems and approaches in functioning health care institutions in Southeastern Michigan. The course is primarily from the point of view of individuals responsible for administering or advising institutions. Students cannot receive credit for both HHS 402 or HHS 491 and HPS 502 or HHS 591. (F,W,S)
Prerequisite(s): HHS 440 or HHS 540 or HPS 440 or HPS 540
Restriction(s):
Can enroll if Level is Graduate

HHS 690  Graduate Research  3 Credit Hours
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project's completion. (A maximum of 3 credit hours of research course work may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Class is Graduate

HHS 691  Topics in Health IT  3 Credit Hours
This is a graduate seminar focused on the latest developments in Health Information Technology. Topics Vary. See schedule of classes for current offerings. May be elected more than once if topics differ.
Restriction(s):
Can enroll if Class is Graduate

HHS 692  Graduate Internship  3 Credit Hours
The internship provides real-world experience for students in a professional environment. Participating employers hire students within parameters set by the internship program. Students are required to submit a report and evaluation documents at the end of each work assignment and participate in an assessment session with the internship staff. (A maximum of 3 credit hours of internship course work may be applied toward graduation requirements upon approval from the Program Advisor.)
Restriction(s):
Can enroll if Class is Graduate

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Health Information Technology (HIT)

HIT 500  Economics of Healthcare  3 Credit Hours
The course will focus on the special features of healthcare as a commodity, the demand for health and medical care services, the economics explanations for the behavior of medical care providers (i.e., physicians and hospitals) and the functioning of insurance markets. Also this course will examine the role of economic justification for government involvement in the medical care system. Finally, we will use the tools we have learned to compare different healthcare systems in the world. Topics include: Production of Health, Demand for Healthcare, and Grossman Model; The Health Economics of Bads; Role of Hospitals, Physicians, Healthcare Labor Market, and The Pharmaceutical Industry; Issues surrounding insurance such as Information Asymmetry, Moral Hazard, Adverse Selection and Lemon's Markets; Government Regulation and Intervention; Comparative Health Care Systems and the impacts of the ACA on health and healthcare.
Prerequisite(s): ECON 201 and ECON 202
Restriction(s):
Can enroll if Class is Graduate

HIT 510  Management of Healthcare Data  3 Credit Hours
This course discusses the nature of and important statistical methods for analyzing healthcare related data. The course begins by covering the structure and semantics of coding systems used in the healthcare industry while avoiding detailed coverage of the meaning of data values. Descriptive statistical methods (graphical and numerical) that depict the central tendency and variability of data; theoretical and empirical probability distributions for discrete and continuous data; point and interval estimations of unknown parameter values; parametric and nonparametric hypothesis tests for numerical, categorical, and ordinal data; analysis of variance; and regression analysis are then covered. A statistical software package will be used to analyze healthcare data.
Prerequisite(s): HIT 500*
Restriction(s):
Can enroll if Class is Graduate

HIT 520  Clinical & Evidence Based Med  3 Credit Hours
This course is a graduate course on Evidence Based Medicine. Course content includes the evidence and causes of inconsistency in healthcare, clinical decision processes, assessment of evidence supporting both diagnostic and treatment decisions, comparing the different research methods in clinical literature, and comparing evidence-based versus traditional approaches to clinical practice.
Prerequisite(s): HIT 510
Restriction(s):
Can enroll if Class is Graduate

Other Content

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

History (HIST)

HIST 5312  European Encounters 1400-1800  3 Credit Hours
During the early modern period, merchants, explorers and travelers set out from the European West in unprecedented voyages of discovery, intensifying interaction between cultures and initiating contact with previously unknown civilizations. In this advances seminar we examine original documents (in English) as well as current scholarship about encounters between groups of Europeans and inhabitants of other parts of the world from the perspective of both sides. Comparing these contradictory (and often incompatible) accounts of the same events, provides a more comprehensive understanding of the process of European expansion, and of the strengths (and limitations) of historical sources. Additional assignments will distinguish the undergraduate and graduate versions of this course.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Arts, Sciences, and Letters

HIST 5401  Seminar: African Diaspora  3 Credit Hours
Research seminar on the history of the African Diaspora in the Atlantic World. This course covers examples of classic texts in the field, as well as significant new scholarship, with an emphasis on critical reading, analysis, and the development of an independent research project. Students gain a deeper understanding of the significance of the African Diaspora in the New World, derived from lectures and discussions providing an overview of this subject, as well as the micro views gleaned from sharing classroom presentation about students’ individual research topics. The graduate version of this course includes weightier readings and assignments, with a research paper for potential publication.
Restriction(s):
Cannot enroll if Class is Freshman or Sophomore or Junior or Senior
Can enroll if Level is Rackham or Graduate

HIST 5505  Feminism & Mod. Mid. East  3 Credit Hours
This course provides an analysis of the history, historiography, and sources for the study of feminism in the Middle East since 1800. Additional assignments will distinguish the graduate version of this course from the undergraduate version.
Restriction(s):
Can enroll if Class is Graduate

HIST 5515  Culture& Hist. in Mod. Iran  3 Credit Hours
Alongside the most influential academic studies of Iran, this course uses cultural sources (such as literature and film) as windows on the pivotal social and political movements in Iranian history since 1800. This study of cultural change factors in cultural debates inside Iran, the growth of the Iranian Diaspora, and the increased presence of Iranian culture in electronic media. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
HIST 5600  U.S. Cultural History  3 Credit Hours
The seminar concentrates on scholarly interpretations of U.S. history through a cultural lens. It features close analysis of classic texts in American cultural history as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the cultural aspect of U.S. history and a familiarity with this mode of analysis, its guiding theories, newest trajectories and scholarly debates, and impact on the field of history as a whole. The graduate version of the course features a major research project. Cannot receive credit for both HIST 490A and HIST 5600.
Restriction(s):
Can enroll if Class is Graduate

HIST 565  The Family in History  3 Credit Hours
An analysis of the emergence of the modern family from the 16th century to the present with focus on the history of childrearing, family size and structure, intrafamilial and inter-generational relationships and population patterns. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY)
Restriction(s):
Can enroll if Class is Graduate

HIST 560  Sem in US Women's History  3 Credit Hours
Seminar on the historiography and key primary sources related to U.S. Women's History. The course covers examples of classic texts in the field as well as significant new works of scholarship, with an emphasis on critical reading, analysis, and historiography of the field. Students gain a deeper understanding of the field, its guiding concepts, foundational texts, newest trajectories, and impact on the field of history as a whole. The graduate version of this course includes weightier readings and assignments.
Restriction(s):
Can enroll if Class is Graduate

HIST 5677  Arab American Identity  3 Credit Hours
Extensive discussions and critical analysis of the main markers of Arab American identity formation from late nineteenth century to present. This seminar provides in-depth assessments of immigrant narratives from various sources and disciplinary approaches on specific racial, ethnic, and gender experiences within the larger U.S. context. Additional assignments distinguish the graduate version of this course from the undergraduate version.
Prerequisite(s): HIST 300
Restriction(s):
Can enroll if Class is Graduate

HIST 5678  Middle Eastern Diasporas  3 Credit Hours
This course explores the diasporas of Arabs, Turks, Assyrians, and Iranians living in Europe and the Americas that have occurred since the 1880s. It pays careful attention to how “aspects of diaspora” shape, mimic, transect, and undermine the political and economic regimes of which they are part. The reception of Middle Eastern communities in different national contexts and historical periods receive special attention as do their adaptive strategies as religious, ethnic, gendered, and racialized minorities. Those enrolled in the graduate level of the course pursue additional readings and assignments.
Restriction(s):
Can enroll if Class is Graduate

HIST 590  Topics in History  1 to 3 Credit Hours
Problems and issues in selected areas of history. Title changes according to content. Course may be repeated when specific topic differs. (OC).

HIST 599  Advanced Ind Studies in Hist  1 to 4 Credit Hours
Readings and analytical writing in history, in accordance with the interests of the student and approval of the instructor. Students must submit a written proposal of study for approval. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (F, W).
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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Human Centered Design and Engineering (HCDE)

HCDE 501  Human Factors and Ergonomics  3 Credit Hours
This course is designed to provide an understanding of ergonomics as a science and process, with an emphasis on people at work. Discussion of ergonomic methods for measurement, assessment, and evaluation, with major topics including manual materials handling, cumulative trauma disorders, environmental stresses, and safety issues. (F, W)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 510  Foundation of HCDE  3 Credit Hours
Full Course Title: Foundation of Human-Centered Design and Engineering
This course introduces human-centered design principles and process. Students learn to apply the process and principles to generate innovative design solutions. Topics include empathy, defining design problem, ideation, emotional design, product prototyping and testing. A semester long team based project allows students to apply classroom learnings to real life design problem. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 520  Research Methods in HCDE  3 Credit Hours
Full Course Title: Research Methods in Human-Centered Design and Engineering
This course surveys qualitative and quantitative research methods in human-centered design and engineering. Different data collection and measurement techniques are covered for different types of data, including subjective, behavioral, and physiological data. Human subject involved experiment design and introduction to basic statistics are also be covered in this course. Other topics include cognitive task analysis, physiological computing in emotional design and sentiment analysis in user needs elicitation process. Students learn to formulate research questions and hypotheses, design and conduct a research study, and present research results through various case studies. (W)
Restriction(s):
Can enroll if Level is Rackham or Graduate
HCDE 530  Information Visualization  3 Credit Hours
This course introduces information visualization techniques and process which produce effective visualization and help people understand and analyze data. Topics include basics of information visualization, including its history and necessity, human aspects to understand how human perceives visual stimuli, considerations to present data, strategic techniques to summarize and display information, and evaluation of information design. (W)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 590  Capstone Project I  2 Credit Hours
Students form project teams, develop capstone topics, initial concepts, deliverables, schedules and necessary pilot study for the HCDE capstone project. (FW)
Prerequisite(s): HCDE 520 and IMSE 577 and HCDE 501
Restriction(s):
Can enroll if Level is Graduate
Can enroll if College is Engineering and Computer Science

HCDE 591  Capstone Project II  2 Credit Hours
Students, working in teams under the supervision of individual faculty members, integrate and apply knowledge acquired in various courses of the HCDE program to a design problem of their choosing. (FW)
Prerequisite(s): HCDE 590
Restriction(s):
Can enroll if College is Engineering and Computer Science

Human Resource Management (HRM)

HRM 561  Human Resource Management  3 Credit Hours
This course provides managers from different business functions with the principles, knowledge, and techniques for managing employees. Incidents and cases are used to diagnose human resource problems, and design and implement solutions. Topics include: employment law, job design and analysis, performance evaluation, human resource planning, recruiting, selection and assessment, training, managerial development, compensation and incentives, reductions-in-force, collective bargaining and labor relations, and human resource management for international operations. The course stresses the evaluation of human resource programs, and the need for human resource practices to be compatible with one another and to be supportive of the firm's strategy.
Prerequisite(s): OB 510
Restriction(s):
Can enroll if Class is Graduate

HRM 580  Compensation and HR Analytics  3 Credit Hours
This course will teach students how to use data-driven analysis to evaluate and improve the intended effects of HR practices such as staffing, training and development, compensation and benefits, and employee retention and engagement. The course prepares you to determine the HR metrics that align with your company's strategic goals (F, W).
Prerequisite(s): DS 520 and HRM 561
Restriction(s):
Can enroll if Level is Rackham or Graduate

HRM 611  Staffing Training and Devlpmnt  3 Credit Hours
The course examines the design and management of personnel staffing, selection, training, and development activities as mechanisms for predicting and influencing individual and organizational performance. Key topics to be covered include: staffing strategy and planning; job design and analysis; external and internal recruiting; employee testing and assessment methods; measurement, validation, and decision-making issues in selection; instructional design and delivery; methods for developing employees and managers; career management; laws and regulation affecting staffing and training; evaluation methods for staffing and training activities; and issues in staffing and training of an international workforce.
Prerequisite(s): HRM 561

HRM 613  Management-Union Relations  3 Credit Hours
To study the rationale for, and processes of, union-management relations. Topics include: contract negotiation and administration; processes of organizing and collective bargaining; and content and philosophy of labor-management relations law. A major portion of the course is devoted to a bargaining simulation exercise.
Prerequisite(s): OB 510 or EMGT 545

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Humanities (HUM)

HUM 509  Feminist Theories  3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women's and men's lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Students will not receive credit for both HUM 409 and HUM 509. Additional reading assignments or projects will distinguish this course from its undergraduate version.
Prerequisite(s): LIBS 560

HUM 533  Writing Women in Renaissance  3 Credit Hours
This course will be taught in English, and will focus in the influence of Italian literary models for the construction of female literary types as well as female voices in France and Italy from 1300 to about 1600. Italian authors studied include three very influential Florentines, Dante, Petrarch and Boccaccio, as well as Castiglione and Ariosto. We will read women poets, patrons, prostitutes and queens from Italy and France such as Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan, Louise Labe, and Marguerite de Navarre. At issue will be women's roles and women's images in city and court culture during the early modern period, and the interaction of their writings with the literary canons of Italy and France. (OC).
Restriction(s):
Can enroll if Class is Graduate
HUM 557  American Cinema  3 Credit Hours
This course will analyze how Hollywood as the nation's dream factory has manufactured fantasies and cultural myths that have constructed the image of American citizenship, both for Americans and non-Americans. It will establish the ideological function of Hollywood texts as providing unifying symbols for a fragmented society. Students who elect the course for graduate credit will do additional graduate-level work as outlined in the course syllabus.
Prerequisite(s):
ENGL 248 or FILM 248 or HUM 248 or JASS 248
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

HUM 577  Ethnographic Film  3 Credit Hours
Prerequisite(s):
FILM 248 or ANTH 101 or ENGL 248 or HUM 248 or JASS 248
Restriction(s):
Can enroll if Class is Graduate

HUM 590  Advanced Topics in Humanities  3 to 4 Credit Hours
The presentation of a topic in a discipline of the Humanities or an interdisciplinary course involving humanities on an advanced undergrad/graduate level.
Restriction(s):
Can enroll if Class is Senior or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
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Indust & Manufac Sys Engin (IMSE)

IMSE 500  Models of Oper Research  3 Credit Hours
The method of mathematical modeling and its application to decision-making problems in organizations. Some widely used models and techniques: linear programming, queuing, inventory, and simulation.
Restriction(s):
Can enroll if Class is Graduate

IMSE 501  Human Factors & Ergonomics  3 Credit Hours
The analysis and prediction of human performance in industrial and other man-machine systems using work sampling, time-motion analysis, synthetic and standard time study, and learning curves, in the design of such systems. Lecture and laboratory. Cannot receive credit for both IMSE 442, and IMSE 501. This class may be scheduled at the same time as the undergraduate course IMSE 442. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s):
IMSE 317* or IMSE 510*
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 502  Computer-Integrated Mfg  3 Credit Hours
This course provides basic knowledge of elements in Computer-Integrated Manufacturing Systems, with particular emphasis on Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Computer-Aided Process Planning (CAPP), materials handling, and information flow in manufacturing systems. Hands-on experiments and course projects are required. Two lecture hours and three laboratory hours. Credit cannot be given for both IMSE 483 and IMSE 502. This class may be scheduled at the same time as the undergraduate course IMSE 483. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s):
HUM 577
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 503  Computer-Aided M/C & Tool Desg  3 Credit Hours
Study of the fundamentals of machine tool design, cutting tools, metal forming dies, and jig fixtures for practical applications in machining and assembly. Principles of design for manufacture and assembly as applied to tool and machine design. Laboratory exercise and projects are required using computer-aided design software. Two lecture hours and three laboratory hours. Credit cannot be given for both IMSE 483 and IMSE 502. This class may be scheduled at the same time as the undergraduate course IMSE 483. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s):
IMSE 382 or ME 381
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 504  Metal Forming Processes  3 Credit Hours
This course focus is on fundamentals of metal forming processes; mechanics of metal forming; formability of manufacture; and economic aspect of the process. Emphasis is placed on analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Laboratory and course project are required. Credit cannot be given for both IMSE 488 and IMSE 504. This class may be scheduled at the same time as the undergraduate course IMSE 488. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s):
IMSE 382 or IMSE 381
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>IMSE 505</td>
<td>Optimization</td>
<td>3</td>
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<td></td>
<td>Theory of linear and nonlinear</td>
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<td>programming. Language multipliers</td>
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<td>and Kuhn-Tucker conditions. Convex</td>
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<td>Prerequisite(s):</td>
<td>IMSE 300 or IMSE 500</td>
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<td>IMSE 508</td>
<td>Modeling of Large-Scale Sys</td>
<td>3</td>
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<td>The modern and classical concepts and tools required for modeling, analysis and synthesis of large-scale dynamic systems. Topics include system dynamics, interpretive structural modeling, cross-impact analysis, information theory, theory of hierarchical systems. Emphasis is on constructing models of real world problems taken from urban, industrial, transportation, and health care systems. Students are asked to select problems of interest and present final project reports.</td>
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<tr>
<td>Prerequisite(s):</td>
<td>IMSE 505 and IMSE 506</td>
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<td>IMSE 510</td>
<td>Probability &amp; Statistical Mod</td>
<td>3</td>
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<td>Prerequisite(s):</td>
<td>IMSE 317</td>
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<td>IMSE 511</td>
<td>Design and Analysis of Exp</td>
<td>3</td>
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<td></td>
<td>One factor, two factor, and multifactor experiments. Fixed random and mixed models. Blocked confounding, incomplete blocks, factorial experiments, fractional factorial experiments. Introduction to response surface analysis.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 512</td>
<td>Taguchi Method of Quality Eng</td>
<td>3</td>
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<td>Quality engineering methodology developed by Genichi Taguchi. Design and analysis of experiments using orthogonal arrays and linear graphs. Accumulation analysis for categorized data. Signal-to-noise ratio as a measure of quality characteristics. Simulation using orthogonal arrays. Parameter design for reducing variability around the target without cost increase. Tolerance design for reducing variability with minimum cost increase. Evaluation and improvement of measurement.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 513</td>
<td>Robust Design</td>
<td>3</td>
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<td>Students will learn models and methods in the context of overall strategies to empirically study the design of products and manufacturing processes to reduce variability and to reduce sensitivity to parameter variation. Topics include: process capability studies and measures, basic DOE concepts, factorial experiments, evaluating sources of variation, evolutionary operation and adaptive statistical process control.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 514</td>
<td>Multivariate Statistics</td>
<td>3</td>
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<td></td>
<td>Linear statistical models used in simple and multiple regression, and analysis of variation. Principles and techniques of principle component analysis are studied and applied to business and engineering problems using statistical computer software.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
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<td>An overview of the project/program management framework and knowledge areas including plan development and execution, scope management, time management, cost management, quality management, human resource management, communications management, risk management, and procurement management. Typical Program Phases and Life Cycles observed in Defense, Construction, Automobile, and Software Industries. Program Organizational Structures, Program Management Processes, and International Project Management are covered. Role of software tools for Program Management and Product Development are discussed. Applications of Lean Product Development Techniques are considered. Cutting waste and lead time in program management are covered. Case studies are used extensively throughout the course.</td>
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<tr>
<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
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<td>Project Planning, Scheduling, and Controlling functions are discussed in detail including work breakdown structure, CPM and PERT methods, resource allocation and leveling techniques, cost control and minimization, trade-off analysis, learning curves overlapping relationships and concurrent engineering, multiple project execution and optimization. Applications of Lean Techniques in program management are discussed as well as the role of IT in accelerating the product development and reducing the program time. The importance of integrating the Supply Chain in the Product Development is also considered. Case studies and project management software are used throughout the course.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 517</td>
<td>Managing Global Programs</td>
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<td>This course focuses on some of the central strategic and organizational problems that arise in managing global programs, including cultural conflicts, developing and managing international managers, global and local brands, and organizing to resolve global-local conflicts. The course uses a combination of case studies, problems, lectures and discussion, over a wide variety of companies and countries.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 515</td>
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<td>IMSE 519</td>
<td>Quan Meth in Quality Engin</td>
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<td>This course introduces the advanced quantitative and analytical methods used in quality measurement, prediction, control and improvement. The topics include sampling design and plan, control charts, statistical quality control, time series, process capability analysis and quality cost analysis. Quality related topics in robust and tolerance design are also included.</td>
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<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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<td>IMSE 520</td>
<td>Managerial Decision Analysis</td>
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<td>Normative decision analysis, decisions, structures, and trees. Utility theory, game theory, and statistical decision theory are introduced. Applications of the theories to management studies in capital investment, bidding, purchasing, and risk analysis are discussed.</td>
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<tr>
<td>Prerequisite(s):</td>
<td>IMSE 510</td>
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</table>
IMSE 5205 Eng Risk-Benefit Analysis 3 Credit Hours
Prerequisite(s): IMSE 510  
Restriction(s):  
Can enroll if Class is Post-baccalaureate NCFD or Graduate  
Can enroll if College is Business

IMSE 521 Mfg Cost Estimation & Control 3 Credit Hours
In this course, concepts of strategic costing in product development and manufacturing are introduced. Engineering economy techniques are used in the study of life cycle cost elements. Equipment acquisition and replacement justification methods under risk and uncertainty are presented.  
Restriction(s):  
Can enroll if Class is Graduate

IMSE 5215 Program Budget, Cost Est & Con 3 Credit Hours
This course focuses on cost estimation and control for program managers and engineers. The course introduces a systematic approach for applying engineering economy techniques in cost estimating, resource planning, cost planning, cost management, and control, and the study of life cycle cost elements. An introduction to decisions under risk and uncertainty as well as an introduction to project crashing are also presented.  
Prerequisite(s): IMSE 510  
Restriction(s):  
Can enroll if Class is Post-baccalaureate NCFD or Graduate  
Can enroll if Level is Rackham or Professional Development or Graduate or Doctorate  
Can enroll if College is Engineering and Computer Science or Business

IMSE 525 Fin & Econ Software Appl 1 Credit Hour
This course applies concepts and techniques of financial management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite.  
Prerequisite(s): IMSE 570 and IMSE 571  
Corequisite(s): EMGT 510  
Restriction(s):  
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 526 Marketing Software Appl 1 Credit Hour
This course applies concepts and techniques of marketing management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite.  
Prerequisite(s): IMSE 570 and IMSE 571  
Corequisite(s): EMGT 535  
Restriction(s):  
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 5275 Managerial Acct Software Appl 1 Credit Hour
This course applies concepts and techniques of managerial accounting to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite.  
Prerequisite(s): IMSE 570 and IMSE 571  
Corequisite(s): EMGT 540  
Restriction(s):  
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 5285 Human Resource Software Appl 1 Credit Hour
This course applies concepts and techniques of human resource management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software.  
Prerequisite(s): IMSE 570 and IMSE 571  
Corequisite(s): EMGT 545  
Restriction(s):  
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 532 Information for Manufacturing 3 Credit Hours
Acquiring and organizing design and manufacturing information (including geometric modeling, group technology, and automated data acquisition). Identifying kinds needed, sources, and recipients. Ensuring information quality; establishing criteria for selecting processing modes and media. Designing, installing, commissioning, and operating information-handling systems. Handling information in production systems.  
Prerequisite(s): (ECE 539 or ME 588) and IMSE 530  
Restriction(s):  
Can enroll if Class is Graduate

IMSE 533 Manufacturing Systems 3 Credit Hours
This course introduces methodologies and tools for modeling, design and operations planning of manufacturing systems. Topics include introduction to integrated manufacturing systems, managing manufacturing system and data modeling methodologies, process planning, group technology, manufacturing system layout, scheduling, push and pull production systems. Industrial case studies are presented and discussed.  
Restriction(s):  
Can enroll if Class is Graduate

IMSE 534 Human Performance Engin in Mfg 3 Credit Hours
The human as a systems component in an information processing context emphasizing capabilities and limitations. The roles of sensing, perception, decision making, short term memory, long term memory, motivation, expectations and attention. An overview of Learning Organization concepts emphasizing personal mastery, mental models, and team learning. A strategy for design of the user-system interface. Analysis methods including functional analysis, traditional and object-oriented task analysis, and cognitive walk-through. Team design project and individual exercises. Emphasis on experiential learning.  
Prerequisite(s): IMSE 530  
Restriction(s):  
Can enroll if Class is Graduate  
Can enroll if College is Engineering and Computer Science
IMSE 536  Machinery Diagnostics  3 Credit Hours
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate

IMSE 537  Metal Machining Processes  3 Credit Hours
Detailed study of the principles of conventional and non-traditional metal removing processes, machine tools accuracy, cutting fluids, and cutting tools. The course emphasis will be on the mechanics of metal cutting, machining processes, cutting tool materials and tool geometry, selection of cutting conditions, planning for machining and optimization of manufacturing process. Role of numerical control in improving machining process and productivity of manufacturing system.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Class is Graduate

IMSE 538  Intelligent Manufacturing  3 Credit Hours
A comprehensive and integrated approach to topics associated with the science of artificial intelligence and their role in today's manufacturing environments. Design and management issues including information systems in an automated and integrated manufacturing environment.
Prerequisite(s): IMSE 317

IMSE 539  Industrial Ergonomics  3 Credit Hours
Effective ergonomic interventions in industrial environment enhance productivity, safety and job satisfaction. This course introduces engineers and engineering students how to apply ergonomic principles in designing industrial and manufacturing operations in which people play a significant role, so that human capabilities are maximized, physical fatigue is minimized, and performance is optimized. Case studies and topics emphasize industrial applications.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 540  Industrial Biomechanics  3 Credit Hours
This course introduces the mechanical behavior of the musculoskeletal systems as related to physical work activities. Fundamentals of human body mechanics (Kinetic and Kinematic aspects of locomotion, body link systems, muscle strength and performance), muscle fatigue and musculoskeletal injury mechanism are covered with application to design of physical work activities and equipment. (YR).
Prerequisite(s): IMSE 442

IMSE 541  Vehicle Ergonomics I  3 Credit Hours
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate

IMSE 542  Product Design and Evaluation  3 Credit Hours
Topics in computer organization; principle data structures (stacks, trees, linked lists) and their use; searching and sorting; algorithm specification, and recursion. Programming assignments will deal with applications of these subjects.
Prerequisite(s): IMSE 317

IMSE 543  Data Management  3 Credit Hours
Topics in computer organization; principle data structures (stacks, trees, linked lists) and their use; searching and sorting; algorithm specification, and recursion. Programming assignments will deal with applications of these subjects.

IMSE 544  Research Methods in Human Factors and Ergonomics  3 Credit Hours
This course covers principals and guidelines of Human Factors and Ergonomics (HFE) practices applied to complex human machine systems. The emphasis is on understanding advanced HFE assessment and surveillance methods in describing and quantifying human-machine-environment interaction. Key topics include, human modeling and simulation, information processing and related motor behavior, and ergonomics design and evaluation tools.
Prerequisite(s): IMSE 442

IMSE 545  Management Info Systems  3 Credit Hours
Basic systems concepts, role of a system analyst in an information system, systems investigation, feasibility study, output/input design, hardware/software evaluation and selection, data management, security considerations, systems implementation, information systems documentations, systems projects estimation and control. Students will be asked to develop a complete information system from case studies.
Prerequisite(s): IMSE 454
IMSE 555  Decision Support/Expert Sys  3 Credit Hours
Decision support process and decision support systems, development tools, executive support systems, expert systems and their development processes, expert shells, integration of decision support and expert systems.
Prerequisite(s): IMSE 350

IMSE 556  Database Systems  3 Credit Hours
Data structures and file processing; GUIDE and CODASYL reports; comparisons among the database management systems, relational, hierarchical, and network approaches; system design guidelines; DDL and Schema/Subschema; DML and Query language.

IMSE 557  Comp Networks and Comm  3 Credit Hours
To study the nature of computing communication and distributing processing techniques, compare networking options, introduce specific business applications that require data communication and networks, and examine the role of communication software in the system, and discuss the related management issues.
Prerequisite(s): IMSE 454

IMSE 5585  Electronic Commerce  3 Credit Hours
This course examines how new information technologies and networks affect the exchange of goods and services between buyers and sellers in firms. What are economics of different electronic commerce models for firms? The course combines critical evaluation of business strategies with hands-on experience in building supporting electronic commerce systems utilizing electronic data interchange (EDI) software. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 559  System Simulation  3 Credit Hours
The modeling and simulation of discrete-change, continuous-change and combined-change stochastic systems. Conducting simulation studies using contemporary software such as SLAM II or random number generation, distribution sampling, and output analysis. Comparisons with analytical queueing models.
Prerequisite(s): IMSE 510

IMSE 561  Tot Qual Mgmt and Six Sigma  3 Credit Hours
This course covers implementing Total Quality Management (TQM), undertaking Six Sigma Projects, and applying Baldrige National Quality Award criteria and ISO 9000 principles to improve quality performances in an organization. Topics include Definitions and Importance of Quality, Quality Costs, Quality Function Deployment (QFD), Product Specification and Critical-to-quality Measures (CQM), Statistical Quality Control (SQC), Robustness Concepts, Quality System Design and Evaluation. Six Sigma and DMAIC Methodologies, Design for Six Sigma (DFSS) process, IDOV (Identification requirements, Design alternatives, Optimize the design and Verify process capability) Methodology, and several other concepts and tools related to quality are also covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate

IMSE 564  Meth & Tech in ERP Sys Develop  3 Credit Hours
Students will explore different technology tools and methodologies for building/customizing applications in ERP systems to meet business need of an Enterprise. Extensive software design and development activities will be covered using modular/Object Oriented Programming, Data Modeling, Data Dictionary, Database Access, User Interface, Dialogue Programming, Interactive Report Design using appropriate tools such as, ABAP Workbench, SAP HANA Native Application Development, and SAP Project Implementation phases.
Prerequisite(s): IMSE 570 and (IMSE 556 or CIS 556)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5655  Supply Chain Management  3 Credit Hours
This course will address theories, concepts, models, methodologies and techniques for managing a supply chain. Topics include supply chain strategy, drivers and metrics of performance, designing global and regional supply chain networks using optimization models, planning demand and supply in a supply chain using forecasting, aggregate planning, and inventory optimization models, designing the transportation systems, pricing, and employing IT systems effectively in supply chains.
Prerequisite(s): IMSE 500 and IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 567  Reliability Analysis  3 Credit Hours
Statistics of reliability and life testing. Application of stochastic models for failure based on Poisson and related processes. Use of exponential and extreme value distribution in reliability. Use of Markov process in the areas of equipment reliability, maintenance and availability.
Prerequisite(s): IMSE 510

IMSE 569  Sys Simulation in Auto Engin  3 Credit Hours
The modeling and simulation of discrete, continuous and combined change stochastic systems. Conducting simulation studies using contemporary software such as ARENA and WITNESS. Topics in simulation methodology include random number generation, distribution sampling, input and output analysis. Integration techniques for continuous simulation, application to design of manufacturing and automotive systems.
Prerequisite(s): IMSE 510

IMSE 570  Enterprise Information Systems  3 Credit Hours
The purpose of this course is to provide a foundation for the analysis, design and implementation of enterprise information systems. Topics include systems and organization theories, and information systems planning and evaluation. Students will be also introduced to various systems development life cycle phases of an enterprise information system. Students will acquire an understanding of the flow of information (forecasts, financial, accounting and operational data) within an enterprise and the factors that should be considered in designing an integrated enterprise information system. This includes all systems in the business cycle from revenue forecasts, production planning, inventory management, logistics, manufacturing, accounts payable, sales, accounts receivable, payroll, general ledger and report generation. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
IMSE 5715  Modeling of Int Info Syst  3 Credit Hours
A review of approaches for modeling of integrated information systems. ARIS architecture. Data, control, function, and organization views of an information system. Requirements definition, design specification, and implementation definition of the different views. Process chain diagrams. Management of ERP projects. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5725  Object Oriented System Design  3 Credit Hours
Students will be introduced to fundamental concepts and methods of object oriented design and development. Topics that will be covered include object oriented database concepts, data models, schema design (conceptual schemas and physical schemas), query languages, physical storage of objects and indexes on objects, version management, schema evolution and systems issues such as concurrent control and recovery from failure. For application programming, a programming language such as C++ will be used for database design and query language. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 574  IS Based Prod Planning & Cont  3 Credit Hours
Students will be introduced to theories, models, methods and techniques in demand forecasting, inventory management, capacity planning, production scheduling and management components, in production planning and control for an enterprise. Application systems to model information sharing between these components will be developed using ERP software such as the SAP R/3 application development suite. (YR).
Prerequisite(s): IMSE 510 and IMSE 570 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5755  Bus Proc Int using Entrpr Tech  3 Credit Hours
Full Title: Business Process Integration using Enterprise Technology
This course introduces the concept of integration, optimization and configuration of strategic business processes across the enterprise using ERP software technology. Use cases and specifications for some of these systems are introduced in different functional areas, such as Finance, Human Capital Management, Logistics, and Project Systems utilizing ERP software. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

IMSE 577  Human-Computer Interaction  3 Credit Hours
Full Course Title: Human-Computer Interaction for UI and UX Design - This course introduces current theory and design techniques concerning how user interfaces (UI) and user experience (UX) should be designed and assessed to be easy to learn and use. Course includes flowing general modules introduction of HCI & UX, Interface/Interaction design strategy; Advanced Issues in HCI; and Evaluation methods.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 579  Software Int Mfg & Logis Mgmt  3 Credit Hours
Students will be introduced to theories, models and techniques in manufacturing, logistics components and their interaction within an enterprise. Topics that will be covered include production/shop order analysis and management, capacity planning, and materials planning and inventory management. Application systems to model information sharing between these components will be developed using ERP software such as the SAP R/3 application development suite. (YR).
Prerequisite(s): IMSE 510 and IMSE 570 and (IMSE 571 or IMSE 5715)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 580  Prod & Oper Engineering I  3 Credit Hours
Production and operations management techniques including forecasting, inventory control, MRP, detailed scheduling, aggregate planning, process variability and its effects on throughput and inventory, factory physics principles, and lean methods.
Prerequisite(s): IMSE 510

IMSE 581  Prod & Oper Engineering II  3 Credit Hours
This course addresses the advanced theory and techniques of production and inventory systems. Topics include advanced forecasting methods, production scheduling and lot-sizing, stochastic single-and multi-item inventory systems, and service operations. This course also includes discussions of research articles on production and inventory systems.
Prerequisite(s): IMSE 580 or EMGT 520

IMSE 5825  Industrial Controls  3 Credit Hours
This course introduces the principle aspects of computers and their applications in manufacturing industries. Discussion on the hardware and software associated with this task and other topics such as integrated systems modeling, sensor technologies, digital and analog signal processing and control, and information communication are also included. Laboratory exercises and projects are required. Credit cannot be given for both IMSE 482 and IMSE 5825. This class may be scheduled at the same time as the undergraduate course IMSE 482. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): ECE 305
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 583  Concurrent Design &Manufacture  3 Credit Hours
This course will cover topics in manufacturing design and analysis with emphasis on the parallel design of product and processes. Topics include principles of design theory, concurrent engineering, group technology, cost estimating, assembly systems, and design for assembly and manufacture. Design projects using computer tools are required on a team-oriented basis.
Prerequisite(s): IMSE 382

IMSE 584  Logistical Systems  3 Credit Hours
Introduction to concepts of physical distribution and logistics management. Quantitative treatment of topics in materials management, transportation, forecasting, warehouse location. Logistical system design techniques which synthesize the above topics in order to design a fundamental system.
Prerequisite(s): IMSE 580

IMSE 585  Material Handling Systems  3 Credit Hours
Studies of material handling methods and equipment, study of techniques used in the analysis and design of material handling systems, study of storage and warehousing systems.
Prerequisite(s): IMSE 500
IMSE 586  Big Data Analysis & Visualization  3 Credit Hours
Topics covered include Big Data’s role in engineering, Data Visualization and Infographics, Design Principles, Univariate, Bivariate, Multivariate Data Visualization, Visualization Groups, Clustering Distance Measures, Hierarchical, Partition-Based, and Fuzzy Clustering. Predictive Analytics using Principal Component Analysis, Multivariate Linear Regression, Discriminant Analysis, and Logistic Regression. Software Tools and Techniques for Visualization and Data Analytics such as Tableau, SAS, VA, Pentaho, and R. (F)
Prerequisite(s): IMSE 510
Corequisite(s): IMSE 510

IMSE 587  Facilities Planning  3 Credit Hours
Analysis, planning, and design of physical facilities utilizing operations research, engineering, and economic principles. Synthesis of physical plant equipment and man into an integrated system for either service or manufacturing activities. Design of material handling systems. Students are required to select problems of interest and present design project reports. Credit may not be given for both IMSE 474 and IMSE 587. This class may be scheduled at the same time as the undergraduate course IMSE 474. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 500

IMSE 588  Big Data High Perf Learning Org  3 Credit Hours
The purpose of this course is to develop students’ knowledge and skills to explore and experience how the disciplines of systems thinking, personal mastery, mental models, team learning, and shared vision impact on organizational learning and influence management practices for building highly performing organizations.

IMSE 590  Grad Study in Sel Topics I  1 to 3 Credit Hours
Individual or group of selected topics in industrial and systems engineering.
Restriction(s):
Can enroll if Class is Graduate

IMSE 591  Grad Study in Sel Topics II  1 to 3 Credit Hours
Continuation of IMSE 590.
Restriction(s):
Can enroll if Class is Graduate

IMSE 593  Vehicle Package Engineering  3 Credit Hours
Vehicle packaging specifications related to exterior and interior design reference points, dimensions and curb loads. Benchmarking package studies, ergonomic tools and design practices used in the automobile industry. Driver positioning considerations; seat height, heel points, hip points, steering wheel location, seat pan, and back angles. Pedal design issues, gear shift positioning. Visibility of instrument panel space. Armrest and console design considerations. Principles and considerations in selecting and location types and characteristics of controls and displays on instrument panels, doors, consoles, and headers. Engine compartment packaging issues. Perception of interior spaciousness and visibility of the road over cowl and hood.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate

IMSE 600  Research in IMSE  1 to 3 Credit Hours
Individual or group study or research in a field of interest to the student. Topics may be chosen from any of the areas of industrial and systems engineering. The student will submit a project report and give an oral presentation at the close of the term.
Restriction(s):
Can enroll if Class is Graduate

IMSE 605  Advanced Optimization  3 Credit Hours
This course will cover selected advanced optimization methods for engineering disciplines and information systems. Topics include nonlinear programming, network optimization, dynamic programming and optimal control. Theories related to optimality and convergence, population-based optimization, etc. will be covered. Students will be expected to write computer program code to implement optimization methodologies.
Prerequisite(s): IMSE 500
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 606  Advanced Stochastic Processes  3 Credit Hours
This course introduces the theory and applications of discrete and continuous stochastic processes and models. The topics include Poisson process, renewal theory, discrete-time and continuous-time Markov chains, martingales, random walks, and Brownian motion. Other Markov processes with applications to queuing, simulation, and operations research in manufacturing and service systems will also be covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

IMSE 610  Adv Top Enterprise Info Sys  3 Credit Hours
This course introduces advanced topics in the development, management and improvement of information systems in the context of supporting large enterprises. It covers emerging issues and solutions in modeling, IT infrastructure and technologies, critical enterprise functions, knowledge engineering, security and governance of enterprise information systems. It focuses on the changing requirements posed by the dynamics of their residing environment and information technology.
Prerequisite(s): IMSE 5715
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 659  Advanced System Simulation  3 Credit Hours
Simulation with animation packages using contemporary software such as SIMAN/CINEMA or SLAM/TESS. Topics in simulation methodology: random number generation and testing, distribution sampling, validation and verification, output analysis, design of simulation experiments, variance reduction techniques, expert systems in simulation.
Prerequisite(s): IMSE 459 and IMSE 559

IMSE 662  Seminar in Comp Proc Control  3 Credit Hours
Advanced treatment of the design of process control systems with emphasis on the modeling of a process of computer control and the design and analysis of a control strategy. Each student is expected to select a project and design and program the control strategy or support software on a mini-computer.
Prerequisite(s): IMSE 582

IMSE 699  Master’s Thesis Project  1 to 6 Credit Hours
Graduate students electing this course, while working under the general supervision of a member of the department faculty, are expected to plan and conduct the work themselves, to submit a thesis for review and approval, and to present an oral defense of the thesis.
Restriction(s):
Can enroll if Class is Graduate
**Information Systems Management (ISM)**

**ISM 525  Computer and Info Systems  3 Credit Hours**

This course focuses on the management concepts and information technology needed to create effective information systems. Topics include: a survey of information technology, information systems and organizations, strategic information systems, management support systems, and ethical and social issues in information systems.

**Restriction(s):**
Can enroll if Class is Graduate

**ISM 526  IT Services Management  3 Credit Hours**

Students in IT Services Management will learn how to organize and operate in an IT environment centered on processes and services. Students will learn to use major models like ISO 20000 and the Information Technology Library (ITIL) as tools for managing and controlling the IT function within an organization. Upon completion of the course, students should be prepared for the ITIL Foundations examination.

**Prerequisite(s):** ISM 525* or MIS 525*

**ISM 527  Programming & Data Structures  3 Credit Hours**

This course introduces the basic concepts of program design, emphasizing an event-driven environment. Students will develop an understanding of fundamental programming logic and learn to use basic programming structures to solve simple business problems. Topics may include an introduction to object-oriented programming and other next generation programming environments.

**Prerequisite(s):** ISM 525* or MIS 525*

**ISM 525  Computer and Info Systems  3 Credit Hours**

This course examines the basic concepts of information management for business organizations. Database systems are examined as a key tool for managing information. The goal of this course is to provide adequate technical detail while emphasizing the organizational and implementation issues relevant to the management of computerized information in an organizational environment. Topics include data modeling, database design, data definition and manipulation languages, database administration, database standards and policies, data, quality, data integration, data warehousing and data mining.

**Prerequisite(s):** ISM 525* or MIS 525*

**ISM 585  Network App Development  3 Credit Hours**

This course is designed for students to explore the unique concerns in developing applications designed to run in a networked environment. The goal of this course is for students to gain proficiency in network-based programming languages, while at the same time understanding concerns specific to networked applications, such as security and latency. Topics include client-server development, distributed object models, training in specific languages such as PHP and PERL, programming and security, and networked application tuning.

**Prerequisite(s):** MIS 527 or ISM 527
**ISM 640** Info Systems Development 3 Credit Hours

This course provides a foundation in systems analysis and design concepts, methodologies, techniques, and tools. Students will learn to analyze an organizational program, define user requirements, design an information system, and plan an implementation. Methodologies covered include the traditional life cycle approach as well as newer methodologies such as an object-oriented approach, joint application development (JAD), and prototyping. A semester-long project gives students the opportunity to apply these techniques to a business problem. This project will use technologies such as computer-aided software engineering (CASE) tool, a database management system (DBMS), fourth generation language.  
**Prerequisite(s):** MIS 575* or ISM 575*

**ISM 641** Enterprise Architecture Network 3 Credit Hours

In this class, students will learn the principles of managing the hardware, software, networks, and data centers that are used in modern enterprises. Students will learn the interfacing of IT systems to business goals and objectives. Traditional architecture frameworks will be discussed, along with the integration of more contemporary topics like cloud networking, green computing, mobile enterprise/BYOD, and virtual services.  
**Prerequisite(s):** MIS 525 or ISM 525

**ISM 642** Information Assurance 3 Credit Hours

This course will provide the students with an exposure to the unique concerns and realities of assuring information and managing risks in the IT environment today. The course will cover principles of security from a managerial point of view, but will provide the students with enough of a technical focus to actively participate in the process of organizational security. Students will be exposed to the problems and dangers from insecure IS and the means, including physical, technical and administrative controls, to prevent security breaches, while also learning to respond to a breach when it does happen. Students will take this knowledge to learn to develop security plans and conduct security audits. Coursework will include extensive reading and seminar participation as well as time in the laboratory to explore and reinforce concepts.  
**Prerequisite(s):** MIS 525 or ISM 525

**ISM 643** Info Tech Project & Chg Mgmt 3 Credit Hours

This course examines the management of information systems projects in business organizations as well as human and organizational reactions to the changes brought about by new information systems. Topics include project planning, change control, project controls, project reporting, information systems projects and organizational change, factors affecting project success and failure, and project management software.  
**Prerequisite(s):** MIS 525* or ISM 525*

**ISM 644** IT Policy and Strategy 3 Credit Hours

This course provides an overview and an understanding of the issues involved in the strategic management of the information technology (IT) and information systems (IS) of an organization and the development of organizational strategies and policies considering environmental constraints. A broad range of issues and problems associated with the information assets of the organization and their alignment with the strategic goals of the organization is examined. An example of topics covered might include: ethical, privacy, and social issues arising within the new information environment; current laws and currently proposed laws and their implications; competition and monopoly in software and hardware markets; and online content and access. Since the course focuses on current issues, the reading each week consists of basic text chapters as well as readings contributed by the professor and class. These readings will change to reflect the dynamic environment of IT/IS. The course prepares students for IT strategy and policy analysis and development. Coursework includes extensive reading, seminar participation, case analysis, research projects, and examinations.  
**Prerequisite(s):** MIS 525* or ISM 525*

**ISM 645** Global Outsource IS Activities 3 Credit Hours

This course provides an overview and an understanding of the issues involved in extensive outsourcing in the global environmental. There exists a growing relationship between globalization, outsourcing, and information technology and the technological and social issues that support or inhibit this relationship is the focus of this class. An example of topics covered might include: national culture, the global IT manager, managing a global IT project, cultural diversity, and ethical and social issues. Since the course focuses on current issues, the reading each week consists of basic text chapters as well as current academic and practical articles. These readings will change to reflect the dynamic environment of IT/IS. Coursework will include extensive reading, seminar participation, case analysis, research projects, and examinations.  
**Prerequisite(s):** MIS 525 or ISM 525 and (MIS 643 or ISM 643 or MIS 644 or ISM 644)

**ISM 646** HCI Interface & Design 3 Credit Hours

This course introduces students to the fields of human computer interaction (HCI), interface design, and usability engineering. The cognitive aspects of HCI will be explored as well as several methods for usability evaluation/inspection. The course will include an examination of the emerging discipline of information architecture. Topics will include: HCI definitions, theories, and history; interface design principles and interaction methods; usability evaluation techniques; usability heuristics and design guidelines; perspectives of designers versus users; and user centered design.  
**Prerequisite(s):** MIS 525 or ISM 525

**ISM 647** Advanced Programming 3 Credit Hours

This course allows students to build on their programming skills learned in ISM 527. Students will be exposed to advanced programming topics, such as multi-threading, multimedia, exception handling, networks, database connections, component-based programming, Web-based applications, and non-technical issues in programming and application development. Students will be introduced to a computer-aided software environment and collaborate on building more complex applications based on business requirements.  
**Prerequisite(s):** MIS 527 or ISM 527

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**University of Michigan-Dearborn 2019-2020**
ISM 648 Information Management II 3 Credit Hours
This course examines the processes and tools used to develop and administer database systems in business. Database systems used to support both transactions processing and decision-making in organizations are studied. A class project involving the development of a database using a client/server database management system is performed. Topics include database development, client/server databases, concurrency control, database security, administration of database privileges, and complex data retrieval commands.
Prerequisite(s): MIS 575 or ISM 575

ISM 649 Business Intelligence 3 Credit Hours
This course will introduce students to the fundamentals of data warehouses (DW) and data mining (DM). Topics will focus on how to leverage big data to support business decisions. Going through major activities involved in a data warehousing project, students will study the principles of dimensional data models, data warehouse architecture and infrastructure, techniques for data extraction, cleaning, transformation, and loading, online analytical processing (OLAP), and managerial issues of data warehouse implementation. Common data mining techniques and applications, such as decision trees association rules, text mining, rule based classification, cluster analysis, machine learning, will be introduced.
Prerequisite(s): MIS 525 or ISM 525

ISM 650 Info System Quality 3 Credit Hours
This course examines two related areas of study: (1) the concepts of information systems analysis and design in business organizations and (2) the management of information quality in organizations. Students will learn to plan and manage information systems projects, determine information requirements, model information process requirements, model system logic requirements, design user interfaces, and implement and maintain information systems. Students will also gain an understanding of the dimensions of information quality, the assessment and improvement of information quality in organizational settings, cognitive and behavioral aspects of information quality, and the effect of information quality on organizational decision making. The implications of information quality for systems analysis and design and applications of systems analysis and design methodologies for the management of information quality will be examined.
Prerequisite(s): MIS 525 or ISM 525

Journalism and Screen Studies (JASS)

JASS 503 Issues in Cyberspace 3 Credit Hours
This course will explore some of the current social, political, legal, and technological issues associated with the use of new media technology to move ideas and information in a democratic society. Examples of areas to be explored include the Internet and World Wide Web, privacy, the future of the mass audience, and the meaning of the First Amendment in the 21st century. (YR).
Restriction(s):
Can enroll if Level is Rackham or Graduate

JASS 506 History & Theory of Documentary 3 Credit Hours
This course surveys the history of European and American documentary and explores its ethical, aesthetic, legal and economic issues. Students study documentary's central moments, forms and artists; the changing theoretical approaches to documentary making; and the range of documentary purposes (informational, educational, propagandistic, entertainment). The course also provides historical and theoretical background for those students who wish to pursue their interest in documentary in the script-writing and production courses also offered in the Communications (Journalism and Screen Studies) Discipline. The graduate course includes a substantial additional research paper, for example on one particular documentary producer, on ethical issues in documentary or on the use of documentary as a political tool.
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Level is Rackham or Graduate

JASS 536 Memoir and Travel Writing 3 Credit Hours
A course in narrative nonfiction that focuses on memoir and travel writing. Reading involves several books as well as classic essay-length examples. Assignments include both short and analytical papers and the writing and revising of three original articles, based on research, interviews, memory, and observation, and drawing on literary techniques. In addition to these assignments, graduate students must prepare a substantial critical analysis focusing on a particular writer or theme, and present their work to the class as well as in writing. (YR).
Prerequisite(s): COMP 106 or COMP 220 or COMP 270 or Composition Placement Score with a score of 40 or COMP 280
Restriction(s):
Can enroll if Level is Rackham or Graduate

JASS 557 American Cinema 3 Credit Hours
This course will analyze how Hollywood as the nation's dream factory has manufactured fantasies and cultural myths that have constructed the image of American citizenship, both for Americans and non-Americans. It will establish the ideological function of Hollywood texts as providing unifying symbols for a fragmented society. Students who elect the course for graduate credit will do additional graduate-level work as outlined in the course syllabus.
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248
Restriction(s):
Can enroll if Level is Rackham or Graduate

JASS 577 Ethnographic Film 3 Credit Hours
This course will analyze ethnographic films as a medium for the construction of meaning in and across cultures. It will teach students to understand how putatively "real" content of documentary film creates a mixture of fantasy, news and "science". Covering texts as varied as National Geographic photographic layouts, traditional ethnographic films made by anthropologists, and auto-ethnographies of cultural groups such as Native Americans and the Trobriand Islanders of Papua New Guinea, the course will aim to deconstruct such oppositions as indigene vs. alien, us vs. them, and self vs. other. (AY)
Prerequisite(s): ENGL 248 or HUM 248 or JASS 248 or ANTH 101
Restriction(s):
Can enroll if Level is Rackham or Graduate

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Frequency of Offering
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### Law & Environment (LE)

**LE 510 Commercial Transactions**  3 Credit Hours
This course provides both the content and context needed to understand the legal impact of business decisions with particular emphasis on commercial transactions. Topics include law of contracts and sales, commercial paper, secured transactions, and debtor-creditors relationships. Student completing LE 453 or equivalent may waive LE 510.

**Restriction(s):**
Can enroll if Class is Graduate

**LE 523 Legal Environment for Managers**  3 Credit Hours
This course equips the student to develop a logical approach to problem solving based on critical legal thinking, sound business judgment, and ethical considerations. The student will be introduced to the principal ways the law is made and enforced, including the development of the common law, statutory interpretation, and agency processes. The course surveys the impact of regulation on the relationships between the business and its customers, suppliers, products or services, employees, and owners. Graduate standing required.

**Prerequisite(s):** BE 530 or BE 504

**Restriction(s):**
Can enroll if Class is Graduate

**LE 556 Business Govt&Regulatory Env**  3 Credit Hours
This course focuses on an interdisciplinary approach to the evaluation of contemporary business issues utilizing elements of law, political economy, international business, ethics, social responsibility and management. Heavy emphasis is placed on case analysis and the development of legal research and critical thinking skills. The goals of the course are to enhance student awareness of the societal influences on business; establish the context from which government regulation arises; and, explore the roles of the free market, government intervention, and individual and corporate ethics in affecting business behavior. Credit not given for more than one of: LE 556, LE 649, BA 649. (F,W,S)

**Prerequisite(s):** BE 530 or BE 504

**LE 606 Legal Environment for Managers**  3 Credit Hours
This course equips the student to develop a logical approach to problem solving based on critical legal thinking, sound business judgement, and ethical considerations. The student will be introduced to the principle ways that law is made and enforced, including the development of the common law, statutory interpretation, and agency processes. The course surveys the impact of regulation on the relationships between the business and its customers, suppliers, products or services, employees, and owners. (AY)

**Restriction(s):**
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

### Liberal Studies (LIBS)

**LIBS 528 Roman Art and Memory**  3 Credit Hours
In this course, we examine Roman art closely associated with personal commemoration and cultural memory, including portraiture, funerary monuments, imperial monuments, and public architecture. We explore these objects’ relationship to Roman literary culture’s theories of mnemotechnics, and in the social context of the Roman obsession with memory perpetuation. We also examine how art historians apply modern theories of collective and social memory in their scholarship on Roman art, creating new ways of understanding Roman sculpture, painting, and architecture. Finally, we investigate Roman spectacle and performance as a vehicle of cultural memory. Graduate students enrolled in this seminar will be exposed in greater depth to the theoretical and historiographical scholarship of cultural and collective memory, as well as to current topics in Roman art. Graduate students are responsible for additional reading assignments and more lengthy and substantial oral presentations and final papers, as outlined below. Students cannot earn credit for both ARTH 428 and ARTH/LIBS 528.

**Prerequisite(s):** ARTH 101 or ARTH 102 or ARTH 103 or ARTH 104 or ARTH 106

**Restriction(s):**
Can enroll if Class is Graduate

**LIBS 583 Early Mod Era/New & Old World**  3 Credit Hours
This is a course on the history of the early modern West from multiple perspectives, with special emphasis on the role played by the Old and New World, together, in the creation of the modern. Course fulfills the Liberal Studies track core seminar requirement. (OC).

**Prerequisite(s):** LIBS 560

**Restriction(s):**
Can enroll if Class is Graduate

**LIBS 599 Independent Studies - MALS**  1 to 3 Credit Hours
Provides opportunity for qualified graduate students in the MALS program to pursue independent research under the direction of a graduate faculty member. Project must be defined in advance, in writing, and must be appropriate to the student’s chosen track. It must be designed to produce a scholarly paper or papers which reflect significant results from the course.

**Prerequisite(s):** LIBS 560

**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Major is Liberal Studies

**LIBS 690 Topics in Liberal Studies**  3 Credit Hours
Presents topics of current interest in graduate liberal studies. Topics vary from term to term. (OC).

**Prerequisite(s):** LIBS 560

**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Program is MALS-Liberal Studies
**LIBS 697  MALS Capstone Experience  3 Credit Hours**

This course is designed as a capstone experience for students in the MALS program who are interested in a non-thesis/non-project option. Its aim is to allow students to reflect and draw upon the knowledge they gained in MALS, and then apply this knowledge in class discussions, essays, and research projects on an interdisciplinary topic chosen from an agreed-upon list of topics that relate to the general MALS curriculum. In the first section of the course, students will reflect upon the interdisciplinary nature of their graduate training, drawing connections between diverse courses they have taken, pinpointing applications to the outside world, and examining the ways that interdisciplinary work has transformed their thinking. The remainder of the class will be organized around an interdisciplinary exploration of one of the following interrelated topics: "Memory", "Identity", "Place", "Community", or "Ways of Knowing". Students will examine how different disciplines and scholars approach the topic. They will also consider the relevance of this broad theme for contemporary issues and debates. Also, students should have completed at least 24 credits in the MALS program, if enrolled concurrently in a LIBS graduate course, or 27 credit otherwise, with a minimum GPA of 3.0.

**Restriction(s):**
Can enroll if Class is Graduate

**LIBS 698  MALS Master's Project  3 or 6 Credit Hours**

An alternative to the usual master’s thesis for students who can present a feasible plan for a project using methods of intellectual exploration and analysis other than the document-based research typically used in preparing a thesis. Might include gathering data through the use of human subjects, as with interviews and survey instruments; creative representation, as in painting; creative writing, and other forms of artistic expression; or devising new modes of interdisciplinary analysis of human experience and thought. To be carried out under the general supervision of a member of the graduate faculty in CAS&L. Project plan must be approved by the MALS program director before student registers for this course. Report and oral presentation to a panel of faculty members required when the project is completed. (F,W,S).

**LIBS 699  MALS Master's Thesis  3 or 6 Credit Hours**

MALS students electing the Thesis option in the last stage of the program will work under the general supervision of a member of the graduate faculty in CAS&L, but will plan and carry out the work independently. A prospectus for the thesis must be approved by the MALS program director before the student registers for this course. The student will submit a report on the thesis and give an oral presentation to a panel of faculty members when the thesis is completed. (F,W,S).

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**Frequency of Offering**

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**Library Science (LIBR)**

**LIBR 575  Issues Lit Child/Yng People  3 Credit Hours**

This course is designed to heighten the awareness and sensitivity of teachers to the treatment of issues in modern and traditional literature for elementary and middle school children. Among these issues will be justice, ethics, abuse, conformity, aging, death, sibling problems, alienation, friendship, prejudice, gender, and other areas of concern. Techniques and activities for fostering discourse and open inquiry in the classroom, relative to the literature, will be explored and presented. (F, YR).

**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

**Linguistics (LING)**

**LING 525  Language and Society  3 Credit Hours**

An examination of the social functions of speech through readings and exercises, emphasizing schools and other applied settings. Topics include ethnic and social class dialects, codeswitching, and the organization of conversation. (OC).

**Prerequisite(s):**
ANTH 101 or LING 280

**Restriction(s):**
Can enroll if Class is Graduate

**LING 561  Modern English Grammar  3 Credit Hours**

The morphological and syntactic analysis of the structure of present day English considered in the light of modern linguistic science. Students cannot receive credit for both LING 461 and LING 561.

**Prerequisite(s):**
LING 280 or LING 480 or LING 580

**Restriction(s):**
Can enroll if Class is Graduate

**LING 564  Contemporary Rhetorical Theory  3 Credit Hours**

An examination of contemporary rhetorical theories through the study of representative practitioners in related developments in linguistics, philosophy, and psychology. (OC)

**Prerequisite(s):**
COMM 201 or COMM 220 or COMM 290 or ENGL 200 or ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250

**Restriction(s):**
Can enroll if Class is Graduate
LING 565  Discourse Analysis  3 Credit Hours
An examination of the syntactic and semantic devices and structures underlying communication in written text and oral interaction. Material to be analyzed will vary from term to term (technical reports, scholarly articles, newspaper stories) but examples will be drawn primarily from the written language. (OC)
Prerequisite(s): (COMP 106 or Composition Placement Score with a score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230 or ENGL 231 or ENGL 232 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or ENGL 239 or ENGL 240 or ENGL 250)
Restriction(s):
Can enroll if Class is Graduate

LING 574  Second Lang Acquisition: Engl  3 Credit Hours
A survey of fundamental concepts and major concerns in the study of English as a Second Language (ESL). The course examines a variety of psycholinguistic and sociolinguistic issues related to second language acquisition (SLA), ranging from theoretical to pedagogical. A primary focus is on developmental patterns and cognitive processes of SLA and individual variation in ESL speakers in terms of their social motivations and learning strategies. Implications for practical concerns such as the ESL teaching profession, instructional materials and curriculum development will be addressed where relevant. Graduate students will be assigned additional readings from a graduate course text and be required to submit an extra data analysis assignment and write a longer research paper.
Prerequisite(s): LING 480 or LING 580
Restriction(s):
Can enroll if Class is Graduate

LING 575  Lang Diversity: Arab Amer Comm  3 Credit Hours
The study of the development, features, functions, and significance of varieties of English in southeastern Michigan, with a focus on the Arab American community. A range of sociolinguistic approaches are explored and applied to the subject matter. Topics to be addressed include code switching, language shift and maintenance, style shifting, and the role of language in identity formation. Students cannot receive credit for both LING 475 and LING 575.
Prerequisite(s): LING 480 or LING 580

LING 576  Sociolinguistics  3 Credit Hours
An examination of sociolinguistic approaches to the issue of variation in language. Areas to be considered include ways of defining and constructing language, different types of language varieties, how variation is structured in language, the role of sociolinguistic variation in linguistic change, and the significance of linguistic acts of identity. (YR)
Prerequisite(s): LING 480 or LING 580
Restriction(s):
Cannot enroll if Level is Undergraduate

LING 577  African American English  3 Credit Hours
An examination of the structure, history and use of African-American English. Topics will include the pronunciation, grammar and vocabulary of African-American English, theories of origin, linguistic repertoire and code-switching in African-American communities, the Ebonics controversy, and the role of this variety in education and identity formation. Additional reading assignments or projects will distinguish this course from its undergraduate version LING 477. Student cannot receive credit for both LING 477 and LING 577.
Prerequisite(s): LING 280 or LING 281 or LING 480 or LING 580
Restriction(s):
Can enroll if Class is Graduate

LING 580  Concepts in Linguistics  3 Credit Hours
An examination of foundational concepts in linguistics and sociolinguistic theory, which explores the intellectual and philosophical problems raised by these concepts. Issues covered include the metalinguistic nature of language studies, the relation of language to the communication systems of other species, the physiological basis of language, language variation, language function and instrumentality, and innate versus learned behavior. (YR)
Restriction(s):
Can enroll if Class is Graduate

LING 582  History of the English Lang  3 Credit Hours
A thorough grounding in the history and structure of the English language. At issue are the linguistic and ideological origins of the concept of Standard English, and the strengths and limitations of different methods of analyzing the history of the language. The course will emphasize sound change, grammatical change, and their sociolinguistic context. (YR)
Prerequisite(s): LING 480 or LING 580
Restriction(s):
Can enroll if Class is Graduate

LING 584  World Englishes  3 Credit Hours
A study of the origin and significance of different forms of English throughout the world. Contact with other languages, pidginization, creolization, standardization, and the formation of the three circles of English are examined. (YR)
Prerequisite(s): LING 480 or LING 580
Restriction(s):
Cannot enroll if Level is Undergraduate

LING 599  Graduate Independent Studies  1 to 3 Credit Hours
Graduate-level research project in accordance with the needs and interests of those enrolled and agreed upon by the student and advising instructor.

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Frequency of Offering

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Local Government Management (LGM)

LGM 507  Strategic Communication  1 Credit Hour
This Internet course addresses three levels of administrative communications - individual, group and organization - and examines the concepts and skills needed to be and effective communicator. Students will develop written and oral applications emphasizing goal-oriented communications and making strategic choices in content, structure, style and delivery. An emphasis is given to applications in the Local Government context. The course also covers basic ethical and legal issues of workplace communications.
Restriction(s):
Can enroll if Level is Graduate or Professional Development
LGM 509  Pub Relations and News Media  1 Credit Hour
LGM 509 is presented in three modules that examine: (1) how the news media operates, (2) "Getting the news" and how to deal with these special constituencies in your community and (3) how to work with the news media as a primary channel of communication to reach residents with information or to influence public opinion. The course includes assignments designed to test your knowledge, improve your media relations skills and help you plan for both proactive and reactive situations involving the news media.

Restriction(s):
Can enroll if Level is Graduate or Professional Development

LGM 511  Citizen Participation for LGM  1 Credit Hour
Local Government Management 511 examines the concepts associated with public participation and develops skills needed by local government administrators in their interaction with the public. Course objectives include: 1) Improve the awareness and recognition of the public and some of the principles of citizen participation in local government. 2) Identify and explore different techniques for enhancing and increasing the public's participation in local government. 3) Increase the understanding of, and compliance with, the legal obligations of local government regarding public hearings and discuss techniques for maximizing the benefit derived from such hearings.

Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

LGM 512  Professionalism/Ethics for LGM  1 Credit Hour
Local Government Management 512 examines the concepts and develops skills needed by local government administrators in ethical decision making and professional behavior. This one hour course encourages local government officials to continually cultivate personal integrity and to respond ethically to challenging situations. Given the recent abundance of ethical failures in government and business (from Watergate to Enron and beyond), and the increasing pressures of complex social and scientific dilemmas, it is essential that leaders see ethics as the greater part of expertise. The course will cover many of the ethical issues local officials encounter, and will analyze means by which local officials can respond ethically and professionally to difficult situations. Finally, the course will explore strategies for influencing a culture of high ethical and professional standards within organizations.

Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

LGM 541  LGM Finance I  1 Credit Hour
Local Government Management 541 examines the concepts and develops skills needed by local government administrators in performing the budgetary and financial requirements of their local community. It identifies the characteristics of an effective budget development process. It also examines and provides guidance on essential financial practices such as managing cash and investments and debt management in the local government context. Course objectives include: 1) Improve the budget development process in your local community. 2) Assess your community's debt situation and develop strategies and policies addressing the local debt. 3) Know how to properly manage cash, revenue and cash disbursements including the management of investments.

Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

LGM 542  LGM Finance II  1 Credit Hour
Local Government Management 542 examines the concepts and develops skills needed by local government administrators in performing financial requirements of their local community. It focuses on proper accounting and auditing practices and procedures and provides guidance on essential financial practices such as procurement policies and procedures, pension, and risk management in the local government context. Course objectives include: 1) Explain the purposes and requirements of accounting and auditing in local government. 2) Explain the purposes and requirements of local procurement procedures, pension plan(s) and risk management policies.

Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

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Marketing (MKT)

MKT 515  Marketing Management  3 Credit Hours
This course examines the concepts, problems and techniques associated with the activities of bringing both consumer and industrial products to the marketplace. Topics include: consumer and industrial buyer behavior, market segmentation, target marketing, as well as product, place, promotion and pricing strategies. Particular emphasis is placed on analysis of cases.

Restriction(s):
Can enroll if Class is Graduate

MKT 554  Graduate Market Research  3 Credit Hours
The goal of this course is to familiarize students with marketing research concepts and techniques. The collection, analysis and interpretation of data for better managerial decision making will be emphasized. Topics include: problem definition, research design, questionnaire construction, sampling, statistical analysis, presentation and evaluation of research findings. (F, S, W)

Prerequisite(s): (DS 520 or IMSE 514) and MKT 515

Restriction(s):
Can enroll if Level is Rackham or Graduate

MKT 565  Advanced Marketing Management  3 Credit Hours
This course examines the current challenges facing the marketers, ranging from industry deregulation, Internet revolution to globalizing. Looked at closely are the emerging issues impinging on marketing decision, particularly in regard to focused marketing, relationship marketing, competitive advantage, positioning, and the marketing mix strategies. Term project and case analyses are important components of the course.

Prerequisite(s): MKT 515

MKT 620  Understanding Customers  3 Credit Hours
This course introduces students to concepts and theories developed in the behavioral sciences (economics, marketing, psychology, sociology, and anthropology) in relation to their influence on consumer behavior. The course is designed to provide students with an in-depth understanding of consumer markets in order to develop effective marketing strategies.

Prerequisite(s): MKT 515
MKT 621 Advertising and Promotion 3 Credit Hours
This course approaches advertising and promotional strategies and tactics from an integrated marketing communications perspective. The course is designed to provide students with an understanding of the various marketing mix elements, including advertising, sales promotion, public relations, direct marketing, event sponsorship, and the Internet in order to develop effective marketing communication strategies.
Prerequisite(s): MKT 515

MKT 622 Global Marketing 3 Credit Hours
This course draws from key concepts in marketing, business economics, and operations management to provide a comprehensive account of global marketing issues and strategies. This course is designed to give students several opportunities to apply the theories and concepts they have learned in class, primarily through the use of Country Manager simulation and a series of case analyses.
Prerequisite(s): MKT 515 and BE 530 and (OM 521 or IMSE 580 or EMGT 520)

MKT 623 Business to Business Marketing 3 Credit Hours
This course examines the differentiating aspect of industrial (business to business) marketing and the operational and strategic issues associated with them. Covers target marketing, marketing mix and strategic decisions involved in business markets. Case studies are an important feature of the course.
Prerequisite(s): MKT 515

MKT 624 Service Marketing 3 Credit Hours
This course examines the development and management of services in a changing and growing global marketplace. Among the challenges addressed will be the development of global service marketing strategies, the process for the development of new services, the role of climate and culture within the organization, strategies for customer retention, quality management and measurement in a service organization, and insights into service demand and the structure of the service industry.
Prerequisite(s): MKT 515

MKT 625 Global Sourcing and Logistics 3 Credit Hours
This course examines concepts in international purchasing and logistics to provide an in-depth understanding of the international supply chain. The course will examine how sourcing and logistics activities change and become more complex in the global environment. These aspects will be discussed in terms of the opportunities, challenges, and changing customer requirements presented by trading blocs, emerging markets, and developing countries.
Prerequisite(s): MKT 515

MKT 626 E-Tailing and Retailing 3 Credit Hours
Increasingly immune to traditional media, shoppers make bulk of their brand decisions in-store. Retailers (brick-and-mortar and Internet) play a vital role in a brand's success in the marketplace. This course provides a comprehensive understanding of the current retail landscape. It introduces students to significant issues and analysis frameworks of 21st century retailing strategy and management, including retailing over the Internet, or “E-tailing.” The Internet presents challenges and opportunities to all retailers. Shoppers shape retail success. Retailers, brick-and-mortar and Internet, are challenged to enhance customer experience, customer service and customer satisfaction. The students will learn the complexities and nuances of shopper behavior, shopper demographics, and how shopper decisions are influenced by store design, store environment, store atmosphere and merchandizing, in brick-and-mortar and Internet stores. The course will elevate and enhance students’ readiness and advancement in retail, brand management and marketing careers. Format: Lecture and discussion, industry reports, group presentations and guest speakers. Regular attendance, class discussions, assignments, written reports and exams.
Prerequisite(s): MKT 515
Restriction(s):
Can enroll if Class is Graduate

MKT 628 MKT Turning Data into Revenue 3 Credit Hours
The objective of this course is to provide a systematic approach to harnessing data to drive more effective marketing decision making and implementation. This course assumes a basic understanding of statistics but does not emphasize the mathematics behind the concepts. Combines with conceptual knowledge about the markets of interest, data is used to build a more profitable marketing practice. Topics covered include segmentation and targeting, positioning, customer value assessment, and new product and service design. By completing this course, you will be well on your way to making the ROI case for expenditures that companies are increasingly asking of the executives.
Prerequisite(s): MKT 515
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

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Mathematics (MATH)

MATH 504  Dynamical Systems  3 Credit Hours
The aim of this course is to survey the standard types of differential equations. This includes systems of differential equations, and partial differential equations, including for each type, a discussion of the basic theory, examples of applications, and classical techniques of solution with remarks about their numerical aspects. Also included are autonomous and periodic solutions, phase space, stability, perturbation techniques, and Method of Liapunov. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 404. Students cannot receive credit for both MATH 404 and MATH 504. (AY)
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 5055  Integral Equations  3 Credit Hours
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 508  Topics for Elem and Mid Tchrs  1 to 4 Credit Hours
Topics such as problem solving, calculators, microcomputers, applications, algebraic and geometric concepts, probability and statistics are to be considered. Emphasis is on developing skills in these topics and their uses in the curriculum.
Prerequisite(s): MATH 385

MATH 508AF  Topics in Math education  2 Credit Hours
Topic: Graphing Calculators in Algebra and Data Analysis. This is one of the courses for special education teachers and their general education partners teaching algebra at the middle or high school level. The sequence emphasizes a deep understanding of the mathematics and of the pedagogical issues in student learning the mathematics with a particular emphasis on the use of the graphing calculator on students understanding and fluency in algebraic thinking and data analysis concepts. This course is for 2 credits.

MATH 508AJ  Topics in Mathematics Educ  2 Credit Hours
Topic: Teaching Geometry with the Nspired Dynamic Geometry Software. This course is part of a sequence of courses for teachers of secondary school mathematics. This course focuses on the use of the dynamic geometry software Nspired to impact the teaching of geometry and student conceptual understanding of geometry. It will also discuss the pedagogical issues in the use the software. This is a two-credit course.

MATH 508N  Topics in Mathematics Educ  2 Credit Hours
Topic: Pedagogical Issues in Mathematics for Struggling Middle School Students. This course continues a sequence of courses for middle school teachers of mathematics offered by the Center of Mathematics Education in collaboration with Wayne RESA. Wayne RESA supports this sequence for districts and teachers who are not supported by either ITQ or MSP grants. It is a follow-up to the course Math 508L which focused on issues in student understanding of algebra. This course expands the focus to consider surrounding pre-algebra topics such as ratios and proportionality as well as geometry and measurement. The sequence emphasizes a deep understanding of the mathematics and the pedagogical issues in supporting struggling students attaining the expectations of Michigan's Grade Level Content Expectations. The course will be for 2 credits.

MATH 508Q  Topics for Elem and Mid Tchrs  2 Credit Hours
Topic: Elementary School Mathematics: Data Analysis and Probability. This course focuses on topics in data analysis and probability for teachers of elementary school mathematics. The data analysis topics include the construction, reading and interpretation of tables and graphs, understanding and calculating measures of central tendency and issues such as scaling, and maximum and minimum and range. The probability topics include the concept of probability and expressing probabilities of simple events as fractions. Important aspects of the work are representation and problem solving. This course will be 2 credit hours.

MATH 508T  Topics for Elem and Mid Tchrs  2 Credit Hours
Topic: Explorations and Investigations in Mathematics in the Upper Elementary Grades. This course is part of a sequence of courses for upper elementary grades teachers of mathematics. The sequence emphasizes a deep understanding of the mathematics and of the pedagogical issues in students' learning the mathematics embodied in the upper elementary grades standards-based curricula. This course will emphasize the content of topics in the Everyday Math series for the upper elementary grades. Its particular focus will be the explorations and investigations that engage students in learning the mathematics with particular attention paid to the use of calculators and games. This course is for 2 credit hours.

MATH 508X  Topics in Teacher Mathematics  3 Credit Hours
Topic: Focal Points in Algebra and Geometry: Middle School to High School. This course is part of a sequence of courses for teachers of middle school mathematics. This course focuses on the application of recently published Michigan middle school curriculum focal points to support student learning and deepen teacher knowledge of the mathematics undergirding the focal points. Important to this study is teacher understanding of the essential understanding students need to be successful in high school algebra and geometry. This is a two-credit course.

MATH 512  First Course in Modern Algebra  3 Credit Hours
Introduction to groups, subgroups, group homomorphisms, factor groups, simple groups, cyclic groups. Sylow theorems, rings, ideals, integral domains, field, polynomial rings, Kronecker's theorem, also properties of the integral, rational, real and complex numbers. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 412. Students cannot receive credit for both MATH 412 and MATH 512. (W)
Prerequisite(s): (MATH 200 or MATH 300) and (MATH 217 or MATH 227 or MATH 228)
Restriction(s):
Can enroll if Level is Rackham or Graduate
MATH 513  Linear Algebra  3 Credit Hours
Vector Spaces, linear transformations and matrices, determinants, inner product spaces, bilinear and quadratic forms. Hamilton-Cayley theorem, eigenvalues and eigenvectors spectral theorem. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 413. Students cannot receive credit for both MATH 413 and MATH 513. (Y).
Prerequisite(s): (MATH 200 or MATH 300) and MATH 216 and (MATH 217 or MATH 227)

MATH 514  Fin Diff Meth for Diff Equat  3 Credit Hours
This course studies the numerical solution of ordinary and partial differential equations using finite difference methods. Topics include convergence, stability, efficiency, numerical simulation and applications of these methods. (OC).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate or Doctorate

MATH 515  B-Splines & Their Applications  3 Credit Hours
A historical look at approximation of functions by polynomials in the uniform and least square norms; B-splines represent the natural and concise extension of approximation be piecewise polynomials; with applications to computer-aided design and geometric modeling.
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 516  Fin Elemnt Meth for Diff Equat  3 Credit Hours
This course studies the numerical solution of ordinary and partial differential equations using finite element methods. Topics include convergence, stability, efficiency, numerical simulation and applications of these methods. (OC).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 520  Stochastic Processes  3 Credit Hours
Review of distribution theory. Introduction to stochastic processes, Markov chains and Markov processes, counting, Poisson and Gaussian processes. Applications to queueing theory. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 420. Students cannot receive credit for both MATH 420 and MATH 520. (AY)
Prerequisite(s): MATH 217 or MATH 227
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 523  Linear Algebra w/Applications  3 Credit Hours
Vector spaces, linear transformations of vector spaces and their representations as matrices and canonical forms for similarity. Inner product spaces, diagonalization of the Hermitian forms by unitary transformations. Applications to linear programming and to the solution of systems of differential equations. (AY)
Prerequisite(s): (MATH 216 or MATH 228) and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 525  Mathematical Statistics II  3 Credit Hours
Internal estimation and pivotal quantities; maximum likelihood estimation; hypothesis tests; linear models and analysis of variance; bivariate normal distribution, regression and correlation analysis; nonparametric methods. Additional reading assignments or projects will distinguish this course from its undergraduate version, MATH 425. Students cannot receive credit for both MATH 425 and MATH 525. (OC)
Prerequisite(s): MATH 325
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 5385  Nmbr Sys & Oper Tchr s  2 or 3 Credit Hours
This course is designed to deepen grades 3-5 elementary teachers' understanding of the whole number and rational number systems. Major topics include interpretations of whole number operations, the extension of whole number operations to rational numbers, the representations of rational numbers and the conceptual underpinnings of non-standard and standard algorithms. Other topics include analyzing number theoretic concepts such as prime numbers and divisibility. Pedagogical and curriculum issues will be addressed as they relate to teaching for understanding and developing computational fluency. The topics of the 2-credit hour course will include whole numbers and operations. The 3-credit course will extend topics covered to rational numbers. Open only to certified teachers. (OC)
Restriction(s):
Can enroll if Class is Graduate

MATH 5386  Geom & Meas 1 Tchr s  2 or 3 Credit Hours
This course will provide participants an opportunity to develop a deeper understanding of the mathematics they teach through a thorough development of the geometric and measurement concepts associated with two-dimensional figures. Topics will include characteristics and properties of geometric shapes with an emphasis on developing mathematical arguments about geometric relationships, transformations and use of symmetry to analyze mathematical situations, measurable attributes of objects and processes of measurement, and appropriate techniques, tools, and formulas to determine measurements. Coursework will focus on developing mathematical thinking and will highlight interactive learning styles. A three-credit course extends measurement to the real numbers by introducing the Pythagorean Theorem. Open only to certified teachers. (OC)
Restriction(s):
Can enroll if Class is Graduate

MATH 5387  Geom & Meas 2 Tchr s  2 or 3 Credit Hours
This course will provide participants an opportunity to develop a deeper understanding of the mathematics they teach through a thorough development of the geometric and measurement concepts associated with three-dimensional figures. Topics will include characteristics and properties of geometric shapes with an emphasis on developing mathematical arguments about geometric relationships and use of symmetry to analyze mathematical situations, measurable attributes of objects and processes of measurement, and appropriate techniques, tools, and formulas to determine measurements. In addition, topics to be covered include the Pythagorean Theorem. Coursework will also focus on developing mathematical thinking and will highlight interactive learning styles. Open only to certified teachers. (OC)
MATH 542  Geometry for Teachers  3 Credit Hours
Properties of two and three-dimensional figures are covered, including congruence, symmetry, transformation, and measurement. Trigonometry from a geometric perspective and the use of trigonometry in problem solving are included. Topics also include coordinate geometry and visualization as well as the nature of axiomatic reasoning and the role it has played in the development of mathematics. An investigative approach involving problem solving, reasoning and proof, connections, and communication will be emphasized. Calculator and computer technology will support the investigation of these topics. Classroom resources and materials are considered. Different levels of geometric thinking will be explored. Open only to certified teachers or elementary education students. (F, W, S.)
Prerequisite(s): MATH 387
Restriction(s): Can enroll if Class is Graduate

MATH 543  Algebra for Teachers  3 Credit Hours
Algebraic structure is emphasized, especially as it relates to arithmetic. Emphasis is on the development of algebraic reasoning and generalizations with appropriate pedagogy. Curriculum issues relevant to teaching algebra for conceptual understanding are included. Major topics include algebraic representations of linear, exponential, power and quadratic patterns, systems of equations, and applications. An investigative approach involving problem solving, reasoning and proof, connections, and communication will be emphasized. Classroom resources and materials are considered as well as calculators and computer technology as problem solving tools to aid in algebraic thinking. Open only to certified teachers or elementary education students. (F, W, S.)
Prerequisite(s): MATH 386

MATH 544  Data Anlys,Prob&Stat forTchrs  3 Credit Hours
Concepts of elementary probability using both experimental and theoretical models are considered with an emphasis on the use of probability models to describe physical phenomena and to make and interpret predictions. Topics in data analysis and statistics include drawing inferences from visual displays of data, applying techniques of inferential statistics, sampling and simulations to generate solutions to problems, and making appropriate inferences using best fit techniques. Evaluation of data and arguments to establish validity, interpreting, calculating and solving problems related to correlation, distributions, percentiles and standard scores are also included. An investigative approach involving problem solving, reasoning and proof, connections and communication will be emphasized. Calculator and computer technology will support the investigation of these topics. Open only to certified teachers or elementary education students.
Prerequisite(s): MATH 387
Restriction(s): Can enroll if Class is Graduate

MATH 540  Pedagogy Content Alg Tchrs I  2 or 3 Credit Hours
This is the first in a sequence of courses for secondary school teachers of mathematics. The sequence emphasizes a deep understanding of the mathematics and the pedagogical issues in students learning the mathematics embodied in the algebra components of secondary school mathematics as defined in the Michigan Merit Exam in mathematics for graduation from high school. The first two courses in this sequence emphasize the algebra and the algebraic reasoning basic to student success in Algebra I and the beginning of Algebra II. The three credit hour course furthers teachers? understanding of the use of mathematical models to represent quantitative relationships. Pedagogical and curriculum issues will be addressed as they relate to teaching for students? understanding of patterns and algebraic content.
Restriction(s):
Can enroll if Class is Graduate

MATH 541  Pedagogy Content Alg Tchrs II  2 or 3 Credit Hours
This is the second in a sequence of courses for secondary school teachers of mathematics. The sequence emphasizes a deep understanding of the mathematics and the pedagogical issues in students learning the mathematics embodied in the algebra components of secondary school mathematics as defined in the Michigan Merit Exam in mathematics for graduation from high school. The first two courses in this sequence emphasize the algebra and the algebraic reasoning basic to student success in Algebra I and the beginning of Algebra II. The three credit hour course furthers teachers? understanding of the use of mathematical models to represent quantitative relationships. Pedagogical and curriculum issues will be addressed as they relate to teaching for students? understanding of patterns and algebraic content.
Restriction(s):
Can enroll if Class is Graduate

MATH 542  Geom & Meas 3 Tchrs  2 or 3 Credit Hours
This course will provide participants an opportunity to develop a deeper understanding of the mathematics they teach through a thorough development of the geometric and measurement concepts associated with two- and three-dimensional figures. Topics will include characteristics and properties of geometric shapes with an emphasis on developing mathematical arguments about geometric relationships, transformations and use of symmetry to analyze mathematical situations, measurable attributes of objects and processes of measurement, and appropriate techniques, tools, and formulas to determine measurements. In addition, topics to be covered include Pythagorean Theorem and right-angle trigonometric concepts. Coursework will also focus on developing mathematical thinking and will highlight interactive learning styles. Open only to certified teachers. (OC)
Restriction(s):
Can enroll if Class is Graduate

MATH 543  Patterns Algebra 2 Tchrs  2 or 3 Credit Hours
This course is designed to deepen in-service teachers’ understanding of patterns and algebraic concepts. Major topics include the representation, analysis, and generalization of a variety of linear and non-linear patterns (including exponential and quadratic) with tables, graphs, words, and symbolic rules; the comparing and contrasting of linear and non-linear patterns; the representation and analysis of mathematical situations and structures using algebraic symbols; the use of mathematical models to represent and understand quantitative relationships; and the analysis of change in various contexts. Pedagogical and curriculum issues will be addressed as they relate to teaching for students’ understanding of patterns and algebraic concepts. Open only to certified teachers. (OC)
Restriction(s):
Can enroll if Class is Graduate
MATH 545  Number & Prop'l Rsng for Tchrs  3 Credit Hours
This course deepens previous work on rational number ideas and applications and explores the concepts of ratio and proportion. Content includes a variety of situations involving proportions, for example, real-world problems involving ratios, rates, and percents; geometry involving similarity; algebra involving linearity; probability involving assigning a probability to an event; and trigonometry involving slope. Distinguishing proportional situations from those that are not and reasoning proportionally in appropriate situations are emphasized. The course includes problem solving, reasoning and proof, connections, communication, and multiple representations. Open only to certified teachers or elementary education students. (OC)
Prerequisite(s): (MATH 442 or MATH 542) and (MATH 443 or MATH 543)
Restriction(s):
Can enroll if Class is Graduate

MATH 546  Discrete Math/Modeling for Tch  3 Credit Hours
This course interweaves the ideas of discrete mathematics with the approaches and strategies of mathematical modeling. It gives pre- and inservice teachers opportunities to deepen their understanding and use of mathematical models based on the concepts of discrete mathematics. Topics include recurrence, induction, permutations, combinations, binomial distributions, circuits, critical paths, minimal spanning trees, adjacency matrices, algorithm design and optimization. Systems thinking and multiple representations are emphasized. Open only to certified teachers or elementary education students. (YR)
Prerequisite(s): (MATH 442 or MATH 542) and (MATH 443 or MATH 543)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

MATH 547  Microcomp in Math for Teach  2 Credit Hours
Use of the microcomputer in the mathematics classroom with an emphasis on the LOGO programming language. Problem solving, hands-on activities, and a cooperative learning environment are emphasized. Open only to certified teachers or elementary education students. (S)
Prerequisite(s): MATH 386

MATH 549  Concepts of Calc for Teachers  3 Credit Hours
Concepts of Calculus for Teachers focuses on calculus concepts appropriate for middle school mathematics teachers and teacher-candidates. The course provides a deep understanding of the major concepts of calculus: rates of change, accumulation (net change), area, and limits. Students will experience concrete approaches to the various topics using problem solving, manipulatives and technology as appropriate, with the intent being to help the learners discover how the ideas of calculus are useful in a variety of settings. Visual, numeric, and commonsense approaches will be used. Open only to certified teachers or elementary education students. (YR)
Prerequisite(s): (MATH 442 or MATH 542) and (MATH 443 or MATH 543)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

MATH 551  Advanced Calculus I  3 Credit Hours
Properties of the real number system; point set theory for the real line including the Bolzano-Weierstrass theorem; sequences, functions of one variable; limits and continuity, differentiability, Riemann integrability. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 451. Students cannot receive credit for both MATH 451 and MATH 551. (YR)
Prerequisite(s): (MATH 200 or MATH 300) and MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 552  Advanced Calculus II  3 Credit Hours
Includes the rigorous study of two and more variables, partial differentiation and multiple iteration. Special topics include: Taylor Series, Implicit Function Theorem, Weierstrass Approximation Theorem, Arzela-Ascoli Theorem. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 452. Students cannot receive credit for both MATH 452 and MATH 552. (AY)
Prerequisite(s): MATH 451 or MATH 551
Restriction(s):
Can enroll if Class is Graduate

MATH 554  Fourier and Boundary  3 Credit Hours
Fourier series and integrals. Their use in solving boundary value problems of mathematical physics by the method of separation of variables. Sturm-Liouville theory and generalized Fourier series, including those involving Bessel functions and Legendre polynomials, with applications. Students cannot receive credit for both MATH 454 and MATH 554. (YR)
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 555  Func of a Complex Var with App  3 Credit Hours
Complex number system. Functions of a complex variable, their derivatives and integrals. Taylor and Laurent series expansions. Residue theory and applications, elementary functions, conformal mapping, and applications to physical problems. Students cannot receive credit for both MATH 555 and MATH 555. (F,S)
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
MATH 558  Introduction to Wavelets  3 Credit Hours
This course will introduce the students to theory and application of wavelets using linear algebra. Topics will include the discrete Fourier transform, the fast Fourier transform, linear transformations, orthogonal decomposition, discrete wavelet analysis, the filter bank, Haar Wavelet family, and applications. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 458. Students cannot receive credit for both MATH 458 and MATH 558. (OC).
Prerequisite(s): (MATH 216 or MATH 228) and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 562  Mathematical Modeling  3 Credit Hours
The processes of constructing, implementing, and evaluating mathematical models of "real world" phenomena are investigated. Models involving continuous and discrete mathematical constructs are considered. Deterministic and stochastic models are compared. Examples are taken from genetics, epidemiology, queueing theory, and other fields. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 462. Students cannot receive credit for both MATH 462 and MATH 562. (AY)
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 572  Intro to Numerical Analysis  3 Credit Hours
Solution of linear systems by Gaussian elimination, solution of non-linear equations by iterative methods, numerical solution of ordinary differential equations, data fitting with spline functions, numerical integration, optimization. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 472. Students cannot receive credit for both MATH 472 and MATH 572. (F)
Prerequisite(s): MATH 217 or MATH 227
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 573  Matrix Computation  3 Credit Hours
A study of the most effective methods for finding the numerical solution of problems which can be expressed in terms of matrices, including simultaneous linear equations, orthogonal projections and least squares, eigenvalues and eigenvectors, positive definite matrices, and difference and differential equations. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 473. Students cannot receive credit for both MATH 473 and MATH 573. (AY).
Prerequisite(s): MATH 217 or MATH 227
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 578  Computer Algebra Systems  3 Credit Hours
The use of computer algebra in various areas of mathematics including the solution of algebraic and differential equations, matrix computations, approximation techniques, probability, and discrete mathematics. Programming within the system is also included. Students will be expected to design, implement, and present a project using a computer algebra system. (OC).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 583  Discrete Optimization  3 Credit Hours
This is an introductory course in discrete optimization at the graduate level for mathematics, science, engineering, and management majors. The goal of this course is to provide an overview of the problem settings in discrete optimization. In particular, the students will learn some of the fundamental combinatorial and heuristic optimization methods used in practice. The main emphasis of the course will be on modeling optimization problems mathematically and solving them using standard optimization techniques. The course will also address the limitations and complexity of the solutions that are found. The important theoretical and practical aspects of discrete optimization will be introduced using standard software packages such as Lingo and Lindo.
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 584  Applied&Algorithmic Graph Thy  3 Credit Hours
Selected graph theory concepts and their application to a variety of real-world problems. A study of associated algorithms. Solution of problems using existing software packages. (OC)
Prerequisite(s): MATH 217 or MATH 227
Restriction(s):
Can enroll if Class is Graduate

MATH 586  Sec School Math for Teachers  3 Credit Hours
Basic concepts, relationships, generalizations, and applications from the secondary school mathematics curriculum are discussed both from an advanced viewpoint and from the standpoint of the learner. Included are the roles of technology, problem solving, and current thinking on the teaching of secondary mathematics topics. Open only to certified teachers or secondary education students. (OC).
Prerequisite(s): MATH 217 or MATH 227
Restriction(s):
Can enroll if Level is Rackham or Graduate

MATH 590  Topics in Math & Stat  3 Credit Hours
A course designed to offer selected topics in different areas of mathematics. The specific topic or topics will be announced together with the prerequisites when offered. Course may be repeated for credit when specific topic differs. (OC).
Prerequisite(s): MATH 216 and (MATH 217 or MATH 227)
Restriction(s):
Can enroll if Class is Graduate

MATH 591K  Topics in Math and Statistics  1 Credit Hour
TOPIC TITLE: Summer Geometry Workshop for Teachers Part 2
MATH 592  Introduction to Topology  3 Credit Hours
Metric spaces, topological spaces, continuous maps, connectedness, compactness, separation axioms. Additional reading assignments or projects will distinguish this course from its undergraduate version MATH 492. Students cannot receive credit for both MATH 492 and MATH 592. (OC).
Prerequisite(s): MATH 451 or MATH 551
Restriction(s):
Can enroll if Level is Graduate

MATH 595  Master's Project Seminar  3 Credit Hours
Students will do a project involving a problem which may be from either an industrial or academic source. It may involve searching for appropriate techniques developed by others or the development of one's own methods. Part of the project will be both written report and an oral presentation to the seminar. In the case that the problem arises from an industrial source there should also be a written and/or oral report to the sponsoring group. (OC).
Restriction(s):
Can enroll if Class is Graduate

MATH 597  Indep Studies in Mathematics  1 to 3 Credit Hours
Independent Study in mathematics for topics at the graduate level. Topics and objectives chosen by agreement between students and instructor.

MATH 598  Indep Study in Math Education  1 to 6 Credit Hours
Independent study project in Mathematics Education under the supervision of a faculty member.
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

MATH 599  Independent Research Project  1 to 3 Credit Hours
Independent research project in applied mathematics or statistics with a faculty or industrial collaborator under the supervision of a faculty member. (YR).
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Mechanical Engineering (ME)

ME 510  Finite Element Methods  3 Credit Hours
Overview and applications of FE theory in linear static and dynamic systems. Review of matrices, strain and stress tensors. Variational and energy principles in FEA. Applications in linear stress analysis; 1D, 2D and 3D. Transient solutions; modal analysis. Modeling concepts. Use of general purpose codes like ANSYS, NISA, ARIES. Project work. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 512  Structural Analysis  3 Credit Hours
Advanced treatment of dynamic structural theories. Topics covered include: Rayleigh and Timoshenko beams and plates; free and forced vibration response of structural components; static and dynamic stability; and impact.
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 514  Advanced Stress Analysis  3 Credit Hours
Stresses and deformations in mechanical and structural elements and systems; theory, analysis and applications. Topics selected from among the following in applied elasticity and advanced mechanics of materials: stress and strain transformation; plane theory of elasticity and stress functions; energy methods; thick-walled cylinders and spinning disks; torsion of non-circular and hollow sections; unsymmetric bending and shear center; curved beams; beams on elastic foundations; plates and shells; elastic stability. Graduate standing or permission of instructor. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 515  Advanced Mechanics of Solids  3 Credit Hours
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 516  Special Topics in Mech Eng  1 to 3 Credit Hours
Selected topics pertinent to mechanical engineering. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 518  Advanced Engineering Analysis  3 Credit Hours
The course emphasizes the exact methods used in the solution of the partial differential equations that arise in advanced engineering problems. Examples are taken from heat transfer, fluid dynamics, solid mechanics, electromagnetic theory, vibrations, etc. Linear integral equations, time dependent boundary conditions, nonlinear boundary conditions, and other topics. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering
ME 519  Basic Comp Methods in Eng  3 Credit Hours
An introduction to basic numerical methods in engineering. Topics covered include solutions of linear and nonlinear algebraic equations, solution of initial and boundary value problems in engineering by shooting, finite-difference and transformation techniques, computer-aided perturbation, numerical inversion of Laplace transformation. Finite-element methods. Solutions of partial differential equations. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, , Bioengineering, Mechanical Engineering

ME 521  Dyn and Therm of Comp Flow  3 Credit Hours
Review of basic equations of fluid mechanics and thermodynamics in control volume form. One-dimensional, compressible flow involving area change, normal shocks, friction, heat transfer, and combined effects. Two-dimensional supersonic flow including linearization, method of characteristics, and oblique shocks. One-dimensional, constant area, unsteady flow. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 522  Advanced Fluid Mechanics  3 Credit Hours
Graduate level course of fluid mechanics. Review of fluid flow phenomena based on common principles of transfer of mass, momentum, and energy. Introduction of the fundamental concepts and methods of analysis of fluid flows in industrial and environmental settings. Navier Stokes equations; viscous and inviscid flows; laminar and turbulent flows; boundary layers; drag; thermal convection. Prerequisite: Full course of undergraduate thermodynamics, fluid dynamics, and heat transfer. Course is the equivalent of ME 520. Students who have already taken ME 520 with a grade of B or better will not receive additional credit for ME 522. (W,YR)

Restriction(s):
Cannot enroll if Class is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 525  Computational Thermo-Fluids  3 Credit Hours

Prerequisite(s): ME 518

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 528  Fund of Boiling and Condenstn  3 Credit Hours
An introduction to the basic elements of condensation and vaporization processes. Topics cover fundamentals such as gas-liquid interfacial phenomena; phase stability and nucleation; two phase flow regimes, and critical heat flux. The course also includes special topics and applications such as convective vaporization and condensation in heat transfer equipment. Three Lecture hours per week.

Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 531  Statistical Thermodynamics  3 Credit Hours
Introduction to statistical methods of evaluating thermodynamic and transport properties. Elements of quantum mechanics, statistical mechanics, and kinetic theory, as applied to engineering thermodynamics. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 532  Combustion Processes  3 Credit Hours

Prerequisite(s): ME 371*

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 535  Advanced Thermodynamics  3 Credit Hours
Advanced treatment of engineering thermodynamics as applied to producing mechanical power and refrigeration. Involves rigorous application of the first and second laws. Topics to be discussed are energy/entropy generation, thermodynamics relations, nonreacting mixtures, and reacting mixtures. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 537  Automotive Air Conditioning  3 Credit Hours
Applications of HVAC fundamentals to analysis and design of automotive air conditioning systems. Topics include psychrometrics, thermal comfort, refrigeration cycles and system design, heating system design, air flow circuits, air space diffusion, compact heat exchanger design, and instrumentation/controls.

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering
ME 538  Vehicle Thermal Management  3 Credit Hours  
This course covers fundamental thermo-fluid principles and advanced topics in thermal management of conventional and electric drive vehicles (EDVs). The topics include: principles of energy conservation, heat transfer, and fluid mechanics; vehicle thermal management system and components; electrification of vehicle thermal management system; EDV thermal management; battery thermal management in EDVs; and waste energy recovery.  
Restriction(s):  
Cannot enroll if Class is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 540  Mechanical Vibrations  3 Credit Hours  
Restriction(s):  
Cannot enroll if Level is  
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering  
ME 542  Advanced Dynamics  3 Credit Hours  
An advanced treatment of analytical mechanics for particles, systems of particles and rigid body motions with special emphasis on three-dimensional motion. Lagrange's equation of motion will be introduced and utilized in the analysis of multiple-mass systems. Computer methods will be covered. Graduate standing or special permission. (YR).  
Restriction(s):  
Cannot enroll if Level is  
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering  
ME 543  Vehicle Dynamics  3 Credit Hours  
A treatment of the response, ride, and maneuvering of motor vehicles. Road loads, suspension systems, mechanics of pneumatic tires.  
Restriction(s):  
Cannot enroll if Level is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 545  Acoustics and Noise Control  3 Credit Hours  
Fundamentals of acoustical waves, sound propagation and intensity, instruments for vibration and noise, HVAC system noise, automobile and aircraft noise, noise control techniques. Graduate standing or special permission. (YR).  
Restriction(s):  
Cannot enroll if Level is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 547  Powertrains I  3 Credit Hours  
Topics in vehicle powertrain kinematics and dynamics, engine output characteristics, vehicle road load analysis, engine-transmission matching, design and analysis of gears and gear systems, planetary gear trains, design of powertrain components, clutch design and analysis, transmission design and analysis, torque and ratio analysis of automatic transmissions. (YR).  
Restriction(s):  
Cannot enroll if Class is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 548  Automotive Powertrains II  3 Credit Hours  
Simulation of vehicle performance; dynamics in gear shifting; engine balance, fuel economy, and performance related to powertrains; powertrain arrangements, manual and automatic transmissions, automotive axles, four-wheel-drive systems; design and manufacturing of gearing systems.  
Prerequisite(s): AENG 547 or ME 547  
Restriction(s):  
Cannot enroll if Level is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 552  Sustainable Energy Systems  3 Credit Hours  
The course provides an overview of energy technology from a broad perspective that encompasses technical and environmental aspects. It covers a wide range of traditional and alternative energy sources and presents assessments of their availability, sustainability, and environmental impacts as well as evaluation of their potential role in solving the global energy problem. Course work includes project.  
Restriction(s):  
Cannot enroll if Class is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 554  Theory of Gearing and Application  3 Credit Hours  
The course emphasizes the theory and methodology for the design, manufacturing and analysis of gears and other engineering surfaces. Topics include differential geometry, kinematics of conjugate motions, surface enveloping, curvatures, cutter design, machine tool settings, simulation of machining process, tooth contact analysis, geometry modeling and design of power transmissions. Graduate standing or special permission. (YR).  
Restriction(s):  
Cannot enroll if Class is  
Cannot enroll if Level is  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering  
ME 556  Stress and Strength Design  3 Credit Hours  
Treatment of stress and strength aspects of machine design. Analytic and experimental determination of stresses in machine members. Evaluation of strength under steady and fatigue loadings. Post-yield behavior, residual stress, temperature and corrosion effects. Graduate standing or special permission. (YR).  
Restriction(s):  
Can enroll if Level is Rackham or Graduate  
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering
ME 558  Fracture and Fatig Cons in Des  3 Credit Hours
A comprehensive review of fracture and fatigue processes in engineering material with emphasis on mechanics instead of mechanisms of failure. Design methodology based on fracture toughness and fatigue crack propagation is presented. Laboratory test methods and data interpretations are also presented. Graduate standing or permission of instructor. (YR).

Restriction(s):
Cannot enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 560  Experimental Methods in Design  3 Credit Hours
Planned experiments and their statistical analysis. Emphasis on application in life and strength testing. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 563  Advanced Instrum and Control  3 Credit Hours
Analysis of design techniques in modern control theory are presented. State space concepts, digital control, and adaptive control methods are covered, along with information on practical implementation problems experienced with these control techniques. Graduate standing or special permission. (YR).

Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 564  Linear Systems Control  3 Credit Hours
This course covers fundamental properties of linear dynamic systems. Topics include linear space, linear operators, Eigen-values/vectors, canonical form, representation, solution of state equations, stability, controllability, observability, design of state feedback control and development of observers with application examples in mechanical engineering. (OC)

Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 565  Mechatronics  3 Credit Hours
Mechatronics, as an engineering discipline, is the synergistic combination of mechanical engineering, electrical engineering, control engineering, and computer science, all integrated through the design process. The course is to establish a working familiarity with the key engineering elements in the design and control of electro-mechanical systems in general and automotive systems in particular. The key engineering elements include microprocessor technology, electronics, sensors and actuators, data communication and interface, control algorithms, and mechanisms of machine elements. The course is to introduce a design methodology in an integrated system environment through case studies and design projects. (AY).

Restriction(s):
Cannot enroll if Class is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 567  Reliability Consid in Design  3 Credit Hours
Theory and application of common statistical distributions to the analysis of both life and strength data for components. Introduction to system reliability. Emphasis on use of digital computer in reliability simulation and analysis. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 570  Powertrain NVH of Elect Veh  3 Credit Hours
This course focuses on the Noise, Vibration and Harshness (NVH) characteristics of Electric Vehicles (EV), Hybrid Electrical Vehicles (HEV), and Plug-In Electric Vehicles (PHEV). Topics include principles of mechanical vibration and acoustics, driveline induced noise/vibration from both conventional internal combustion engine and electrical motor/generator, cooling fan noise, regenerative braking system and electrical accessory noise. The potential countermeasures for typical noise/vibration sources will be presented. The course consists of classroom lectures and experimental laboratory sessions. The laboratory sessions will provide the student with hands-on experience on noise/vibration measurements and analyses. The student will be required to carry out a course project on NVH related subject of electrified vehicles.

Restriction(s):
Cannot enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 571  Conduction Heat Transfer  3 Credit Hours
Conduction heat transfer in steady and transient state, including heat sources. Analytical, numerical, graphical, and analog methods of solution for steady and fluctuating boundary conditions. Thermal stresses. Dynamics of thermal instrumentation and heat exchangers. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 572  Convection Heat Transfer  3 Credit Hours
The course is primarily concerned with the determination of the rate of heat transfer due to the transport of energy to or from surfaces by both molecular conduction processes and gross fluid movement inside channels and over external surfaces. Emphasis will be placed on basic understanding of the convection heat transfer phenomena and the necessary mathematical techniques for the solution of such problems along with engineering applications. Graduate standing or special permission. (YR).

Restriction(s):
Cannot enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering
ME 573  Radiative Transport of Heat  3 Credit Hours
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 576  Battery Sys Modeling & Ctrl  3 Credit Hours
Full Course Title: Battery Systems, Modeling, and Control This course will cover modeling, control, and estimation techniques for battery systems. Students will learn how electrochemical systems work and how they can be mathematically described. A simple phenomenological electrical circuit model and a detailed physics-based model that can capture diffusion dynamics will be covered. The thermal behavior of a battery system and its modeling will be covered as well. Students will learn the basic functions of battery management systems for monitoring state-of-charge, state-of-power, and state-of-health in applications to automotive and consumer electronics. (OC).
Restriction(s):
Can enroll if Level is Doctorate or Rackham or Graduate
Can enroll if Major is , Automotive Systems Engineering

ME 577  Energy Conversion  3 Credit Hours
This course covers fundamental engineering principles for converting available energy sources, renewable and nonrenewable, into other energy forms of direct utility. It may include such topics as steam and gas based power plants as well as devices for solar, wind, and hydraulic energy conversion.
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 580  Advanced Engineering Materials  3 Credit Hours
A second course in materials which expands the philosophy that all materials possess common traits which allow: (1) interchange of classes of materials to perform the same function, e.g., metals, polymers, ceramics, composites, etc.; and (2) understanding of the mechanisms of property controls in new materials. There is an attempt to provide equal representation of the science and the phenomena of engineering materials. Greater emphasis is placed on thermodynamics, stress-strain relations, multicomponent phase equilibria, and such other areas as received minimal exposure in the first course in materials. As a result of present technology trends, more time is spent on composites and achievement of design specifications through synthesis. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 582  Injection Molding  3 Credit Hours
This is an in-depth course on injection molding processes, which include the conventional injection molding process, low pressure injection molding, structural sandwich molding, gas assisted injection molding etc. Material, process and tool design parameters are emphasized. The roles of rheology and flow modeling are discussed. Design issues for injection molded products are also discussed. Injection molding applied to other materials, such as ceramics, is also described. (YR).
Restriction(s):
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 583  Mechanical Behav of Materials  3 Credit Hours
Mechanical behavior of materials are covered in relation to their structures, deformation characteristics and failure mechanisms. Means of improving strength, fracture toughness and other mechanical properties are discussed. Environmental effects on mechanical behavior are also included. The emphasis is on metals; however, polymers and ceramics are also covered. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 584  Mechanical Behavior of Polymer  3 Credit Hours
Mechanical behavior of polymers and ceramics are considered in relation to their structures, processing and applications. Emphasis is given on their deformation, fatigue and fracture characteristics. Strengthening mechanisms for both materials are discussed. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 585  Cast Metals in Eng Design  3 Credit Hours
An understanding of the properties of the most important cast metals is obtained by melting, casting, and testing. In addition to measurement of mechanical properties, resistance to heat, wear, and corrosion is discussed. The application of these properties in the design of critical parts in the aircraft, automotive, chemical, mining, and railroad industries is presented by case histories and examination of castings. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 586  Materials Consid in Manufact  3 Credit Hours
Manufacturability of materials and influence of processing variables on the properties of manufactured products are important considerations in materials selection and product design. These issues are addressed on the basis of mechanical deformation and thermal characteristics of materials during processing. Test methods to measure formability, castability, machinability, etc., are critically discussed. Defects in manufactured products including their origin and detection are also discussed. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering
ME 587  Automotive Composites  3 Credit Hours
The emphasis in this course is on automotive composites, such as SMC, SRIM and RTM. In addition to properties and applications of these materials, this course covers manufacturing processes, design considerations, test methods and quality control techniques used for automotive composites. The use of continuous fiber composites in automotive applications, such as leaf springs, drive shafts and energy absorbing structures, are also discussed. (YR).
Restriction(s):
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 589  Composite Materials  3 Credit Hours
This course will consider four different aspects of composite materials; namely, materials, mechanics, manufacturing and design. Recent developments on fiber reinforced plastics and metals will be covered. Fundamental analytical concepts on micro and macro mechanics will be emphasized to create a better understanding of the design principles of composite materials. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 591  Degradation of Materials  3 Credit Hours
The course will introduce students to the fundamentals of corrosion and degradation behavior of materials. The degradation of metals, polymers and composites will be discussed. Monitoring and life prediction techniques will be covered. Preventive measures such a materials selection and design, protective coating, surface treatments, inhibitors, and electrochemical techniques are applied, when they should be used, and how various techniques can be integrated to solve complex problems. (AY).
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 592  Fuel Cells  3 Credit Hours
This course covers fundamentals of fuel cell systems for both automotive and distributed power applications. Detailed descriptions of the principles and component designs of various types of fuel cells including proton exchange membrane fuel cell (PEMFC), phosphoric acid fuel cell (PAFC), solid oxide fuel cell (SOFC), and molten carbonate fuel cell (MCFC). Discussions on water and thermal management, and balance of power plant. Review of hydrogen storage and safety consideration. Challenges and future opportunities.
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 593  Powder Materials & Processing  3 Credit Hours
A lecture course that provides a comprehensive understanding of the theory and principles, the associated synthesis, processing, and characterization techniques; and the applications of powder and particulate materials. The students will gain knowledge of the following: fundamentals of powder and particulate materials (metals and ceramics), various metallic and non-metallic powder synthesis/production techniques, diverse techniques of powder characterization, and the principles and methods of homogenization, compaction, and sintering. Students will be exposed to the relevant criteria for designing parts/components based on powder and particulate materials and, will familiarize themselves with a wide range of applications-as structural, functional, and biomedical components made of metallic, ceramic, and composite powders-in various industries. (OC)
Restriction(s):
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 595  Digital Manufacturing  3 Credit Hours
This combined lecture and hands on project course aims to train students to optimize the interplay of materials, people, machines and profitability. The course introduces methods to identify product concepts with commercial potential. Student teams will perform market analysis and explore the intellectual property space around their ideas and rapidly iterate them into a final prototype via direct digital manufacturing (e.g., 3D CAD/CAM files manifested via digital printing or machining). Advanced instruction on direct digital manufacturing tools will be given, and customer response will be used as feedback. Early stage prototypes will progress into more sophisticated designs, scaling up (cost, pricing, tooling, process flow and automation) scenario planning for mass manufacturing as well as Failure Mode Effect Analysis (FMEA) will be discussed. (WYR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 596  Internal Combustion Engines I  3 Credit Hours
Comparison of several forms of internal combustion engines including Otto and Diesel type piston engines; performance parameters and testing; thermodynamic cycles and fuel-air cycles; combustion in SI and Diesel engines; charge formation and handling; ignition; elements of exhaust emissions. (Not available to students with ME 496 or equivalent background.)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 597  Internal Combustion Engines II  3 Credit Hours
Fuel flow and air flow measurements and techniques; engine maps; fuel and ignition control and control strategies; combustion and burn rate considerations in engine design; intake and exhaust systems; emissions and control strategies; emission test procedures.
Prerequisite(s): AENG 596 or ME 596
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering
ME 598  Engine Emissions  3 Credit Hours
This course introduces students to the fundamentals of engine exhaust emissions, including their formation mechanisms and abatement techniques. The students will be familiarized with the present emission control technologies and future challenges. The topics covered include: engine emissions and air pollution; review of emission regulations; catalyst fundamentals; catalyst aftertreatment techniques for gasoline, diesel, and lead-burn engines; discussion of cold start emission control and breakthrough catalytic technologies. (AY).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 600  Study or Res in Sel Mech Eng  1 to 3 Credit Hours
Individual or group study or design in an area of Mechanical Engineering under the supervision of a member of the graduate faculty. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

ME 601  Exper Research in Mech Eng  1 to 3 Credit Hours
Laboratory investigation in an area of Mechanical Engineering under the supervision of a member of the graduate faculty. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Class is Graduate

ME 602  Guided Study in Mech Eng  1 to 6 Credit Hours
Independent Study of specified material in an area of Mechanical Engineering under the guidance of a member of the graduate faculty. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term. Graduate standing or special permission.
Restriction(s):
Can enroll if Class is Graduate

ME 607  Adv Mechanical Engin Problems  3 Credit Hours
A graduate-level analytical study of selected topics in mechanical engineering. The subjects of study in each term usually depend on student and instructor interest. Typical areas of study include vibrations of continuous or lumped systems, fluid mechanics, devices, thermodynamics, heat transfer, mechanics of solids, materials, or processing, etc. The course can be organized to meet the subject needs of a group of students with mutual interests.
Restriction(s):
Can enroll if Class is Graduate

ME 611  Modeling of Engr Mats  3 Credit Hours
Full Course Title: Modeling of Engineering Materials This course will present the mathematical models and constitutive behavior of engineering materials subjected to mechanical and non-mechanical loads. It will consider both linear and non-linear models to describe elastic, plastic, viscoelastic, viscoplastic, hypo- and hyper-elastic response of materials to mechanical loads. Non-mechanical loads will include thermal and electro-mechanical fields. Micro-scale and multi-scale mechanical modeling will also be introduced. (OC)
Prerequisite(s): ME 518
Restriction(s):
Can enroll if Class is Graduate or Rackham or Graduate
Can enroll if Program is

ME 622  Adv Topics in Fluid Mechanics  3 Credit Hours
The course presents selected topics of contemporary advanced fluid mechanics, such as the hydrodynamic stability theory, turbulence, multi-phase flows, magnetohydrodynamics, interfacial flows, flows of non-newtonian fluids, micro- and nano-fluid mechanics, biofluid mechanics, etc.
Prerequisite(s): ME 522
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Program is PHD-Automotive Engineering, MSE-Mechanical Engineering, MSE-Automotive Engineering

ME 640  Advanced Vibration Theory  3 Credit Hours
The course will emphasize the similarities between various types of continuous systems as well as common features of continuous and discrete systems. Variational principle will be introduced as a notion of natural modes of vibration for discrete systems is reviewed. Natural modes of vibration for continuous systems will be discussed using the boundary value formulation, the general formulation of the eigenvalue problem and orthogonality. These concepts will be applied to bars, rods, membranes, and plates. Approximate methods will be introduced to determine the natural modes of vibration for complex continuous systems. A few methods to be considered include the Rayleigh-Ritz, Galerkin, Collocation, Myklestad, and Lumped-parameter methods. All the approximate methods presented will allow expedient numerical solution by means of high-speed computers. The damped and undamped response to deterministic excitations will be considered for various systems. Graduate standing or special permission. (YR).
Prerequisite(s): ME 540
Restriction(s):
Can enroll if Level is Rackham or Graduate

ME 642  Predictive Control of Dynamic Systems  3 Credit Hours
This course covers predictive control of dynamic systems to students working on controls. The topics will include unconstrained and constrained optimization, discrete-time optimal control problems, dynamic programming, stability, invariance, reachability, and linear predictive control problems with application examples in mechanical engineering. (OC).
Prerequisite(s): ME 564 or ECE 560
ME 699  Master’s Thesis  1 to 6 Credit Hours
Graduate students electing the course, while working under the general supervision of a member of the department faculty, are expected to plan and carry out the work themselves and submit a thesis for review and approval, and also present an oral defense of the thesis. Students must satisfactorily complete 6 credit hours in ME 699, but these hours may be spread over more than one term. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Class is Graduate

ME 791  Adv Guided Research  1 to 6 Credit Hours
Independent study and research work on the material related to the doctoral research project under the guidance of the faculty advisor. The course is for doctoral students who have not completed the PhD program's coursework requirements. A report and an oral presentation are required. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate Can enroll if College is Engineering and Computer Science Can enroll if Major is Mechanical Engineering

ME 798  Doctoral Seminar  0 Credit Hours
After attaining candidacy, every Ph.D. student is required to attend and actively participate in research seminars given by CECS Dean's office or individual departments in CECS. A student gets a satisfactory grade if he/she attends at least two research seminars during the course period. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate Can enroll if Major is

ME 980  Pre-Cand Dissertation Research  1 to 9 Credit Hours
Full Title: Pre-Candidate Dissertation Research Dissertation work by a pre-candidate student in Mechanical Sciences and Engineering program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate Can enroll if Major is

ME 990  Doctoral Dissertation  1 to 9 Credit Hours
Dissertation work by a student of the Ph.D. in Mechanical Sciences and Engineering Program conducted under guidance of the faculty advisor. The student must be admitted to the Ph.D. candidacy status.
Restriction(s):
Can enroll if Level is Doctorate or Can enroll if Major is

Microbiology (MICR)

MICR 505  Applied & Environ Microbiology  3 Credit Hours
Advanced treatment of the interplay of microorganisms and the environment. Topics will include soil and water microbiology (bacteria, archaea, fungi, algae) and plant-microbe interactions (pathogenic and symbiotic) as well as the role of microorganisms in decomposition, nutrient cycling, and bioremediation. Three hours lecture. Students cannot receive credit for both BIOL/MICR 405 and MICR 505. (W, AY)
Restriction(s):
Can enroll if Level is Rackham or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Modern & Classical Language (MCL)

MCL 501  Images of Women in Germany  3 Credit Hours
This course will focus on the position of women in Germany after WWII and up to and after the unification of East and West Germany. Particular attention will be given to the gendered history of working through the National Socialist past, the division and reconstruction of the two nation-states, and the terrorism in West Germany in the 1970's. Students will examine images of women in films and tie them to the ideologies of gender and status of women in these larger issues of German history. Course readings will be in English. Additional assignments will distinguish this course from its undergraduate version. Students cannot receive credit for both MCL 401 and MCL 501.
Restriction(s):
Can enroll if Class is Graduate

MCL 555  This American Life  3 Credit Hours
The course "This American Life: Immigrant Literature and the American Dream" is a literary and cultural analysis of the literature of immigration. The readings are from works of fiction in a variety of genres, and are written by American and non-American prize-winning authors. Their common denominator is the pursuit of the American Dream and its many multifaceted aspects. The themes explored include: assimilation, acculturation, diversity, language, subculture, intertextuality, nostalgia, belonging, and double identity. This course will be distinguished from its undergraduate counterpart, MCL 455, by the inclusion of additional readings and assignments.
Restriction(s):
Can enroll if Class is Graduate

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Natural Science (NSCI)

NSCI 531 Adv Learning Inquiry: Phys Sci 3 Credit Hours
This course is designed to provide in-service teachers with additional tools and knowledge to teach physical science concepts to elementary and middle school students. Topics selected from the science benchmarks in the Michigan Curriculum Framework (MCF) will be explored at significant depth. Students will be expected to integrate major themes of the physical sciences and understand how the topics covered in the course fulfill the National Science Education Standards (NSES) and the MCF. The learning cycle and inquiry methods of instruction will be modeled and students will be expected to use these in their assignments. (YR).
Prerequisite(s): NSCI 231
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
Can enroll if College is Education, Health, and Human Services

NSCI 532 Adv Inquiry: Earth/Planet Sci 3 Credit Hours
This course is designed to provide in-service teachers with additional tools and knowledge to teach the concepts of Earth and planetary science to elementary and middle school students. Topics selected from the science benchmarks in the Michigan Curriculum Framework (MCF) will be explored at significant depth. Students will be expected to integrate major themes and understand how the topics covered in the course fulfill the National Science Education Standards (NSES) and the MCF. The learning cycle and inquiry methods of instruction will be modeled and students will be expected to use these in their assignments. (YR).
Prerequisite(s): NSCI 232
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
Can enroll if Level is Rackham or Graduate

NSCI 533 Adv Inquiry: Life Science 3 Credit Hours
This course is designed to provide in-service teachers with additional tools and knowledge to teach biological science concepts to elementary and middle school students. Topics selected from the life science benchmarks in the Michigan Curriculum Framework (MCF) will be explored at significant depth. Students will be expected to integrate major biological themes and understand how the topics covered in the course fulfill the National Science Education Standards (NSES) and the MCF. The learning cycle and inquiry methods of instruction will be modeled and students will be expected to use these in their assignments. (YR).
Prerequisite(s): NSCI 233
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
Cannot enroll if Level is Graduate
Can enroll if College is Education, Health, and Human Services

NSCI 598 Independent Study in NSCI 1 to 3 Credit Hours
Provide an opportunity for students to pursue graduate level independent library-based research under the direction of a faculty member. For students who wish to conduct an area of study that is interdisciplinary rather than an area focused on a specific science. The student and the faculty member must complete a contract outlining the area to be studied and the product of the research. The project must be approved by the program director and the faculty member before students register for the course.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Arts, Sciences, and Letters

NSCI 599 Laboratory Research in NSCI 1 to 3 Credit Hours
Provide an opportunity for students to pursue graduate level independent laboratory-based research under the direction of a faculty member. For students who wish to study an area that is interdisciplinary rather than an area focused on a specific science. The student and the faculty member must complete a contract outlining the area to be studied and the product of the research. The project must be approved by the program director and the faculty member before students register for the course.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Arts, Sciences, and Letters

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Frequency of Offering

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Operations Management (OM)

OM 521 Operations Management 3 Credit Hours
Operations Management is concerned with the efficient transformation of inputs that will effectively achieve customer satisfaction. In dynamic, competitive world, a company's effectiveness depends significantly on how well the firm's resources are managed. This course focuses on managerial tools for understanding the processes that are required for developing and delivering appropriate products and services. It prepares managers to use the results of analysis to constantly improve the firm's operational performance.

OM 571 Supply Chain Management 3 Credit Hours
This course aims to develop an understanding of key concepts of global supply chain management performance and their interrelationship with the firm's strategy. Special emphasis is given to tools and skills necessary to develop solutions for a variety of supply chain design problems. The overarching course objective is to develop and in-depth understanding of integrative managerial issues and challenges related to developing and implementing a firm's strategy.
Prerequisite(s): OM 521* or IMSE 580* or EMGT 520*
OM 631 Service Operations Management 3 Credit Hours
This course examines both traditional and new approaches for achieving operational competitiveness in service businesses. Major Service sectors such as health care, banking and financial services, transportation, restaurants, hotels, and resorts are examined. The course addresses both strategic and operational decision making. Among topics covered are: the service concept and operations strategy, design of effective service delivery systems, productivity and quality management, response time (queuing) analysis, capacity planning, yield management, and the impact of information technology.
Prerequisite(s): OM 521 or IMSE 580 or EMGT 520
Restriction(s):
Can enroll if Class is Graduate

OM 660 Supply Chain Analytics 3 Credit Hours
The purpose of this course is to equip students with decision support models and tools to recognize, analyze, and resolve supply chain problems. Compared to other supply chain management courses, it is designed for a more analytical oriented audience, including applications of advanced analytics as well as business intelligence and reporting aspects of supply chain management. This course focuses on identifying and reformulating problem statements and provides students with hands-on experience to solve those identified problems by applying analytical tools and models.
Prerequisite(s): OM 521 or IMSE 580 or EMGT 520
Restriction(s):
Can enroll if Class is Graduate

OM 661 Supply Chain Logis Mgmt 3 Credit Hours
The overarching course objective is to develop and in-depth understanding of integrative managerial issues and challenges related to developing and implementing a firm’s logistics strategy. Attention is directed to the logistical mission confronted by varied types of business organization. Logistics is positioned as a value-added process that achieves time and place synchronization of demand stimulation and operations fulfillment. Emphasis will be placed on challenges related to providing logistical support for procurement, manufacturing and market-distribution.
Prerequisite(s): OM 521 or IMSE 580 or EMGT 520
Restriction(s):
Can enroll if Class is Graduate

OM 662 Product Dvlpmnt & Tech Mgmt 3 Credit Hours
The objective of this course is to provide in-depth knowledge of the frameworks, policies, and issues that arise in the design and development of new products and the management of technology. In particular, the integration of new product development and innovative technology management within a supply chain forms the basis of knowledge offered in this course including the set of activities and processes associated with new product introduction and the development of new technologies. Topics include the product design and development phases, firm capabilities, product architectures, the make vs. buy decision, supplier involvement, industrial design, design-for-manufacturing, prototyping, and the management of technological change. Part of the course is project-based and covers modern tools and methods for product design and development.
Prerequisite(s): OM 521 or IMSE 580 or EMGT 520
Restriction(s):
Can enroll if Class is Graduate

OM 663 Lean & Six Sigma 3 Credit Hours
The purpose of this course is to provide a broad exposure to the principles and philosophies behind lean production and Six Sigma methodologies. Lean production and Six Sigma are widely adopted by a variety of firms and organizations in different industries for their abilities to generate significant and lasting operational improvement. A management overview of both methodologies with an emphasis on best business practice is provided in addition to coverage of fundamental tools and concepts.
Prerequisite(s): DS 520 or IMSE 514
Restriction(s):
Can enroll if Level is Rackham or Graduate

OM 664 Strategic Sourcing 3 Credit Hours
This course presents the integrative role of procurement function within the business organization. Specific topics addressed from strategic, financial, and global perspectives include purchasing process, procurement and commodity strategy, insourcing/outsourcing, supplier evaluation and selection, supplier management and development, global sourcing, cost and price analysis, negotiation and contract management. Both theoretical and quantitative perspectives will be offered in covering these topics. Learning will be emphasized through review of articles published in academic and professional journals; discussion of case studies focusing on problems and issues involving sourcing; formulation of sourcing models using statistical and optimization software and application of various problem-solving algorithms; and working on a term project focusing on investigating a key sourcing problem.
Prerequisite(s): OM 521 or IMSE 580 or EMGT 520
Restriction(s):
Can enroll if Class is Graduate

OM 665 IT in SCM 3 Credit Hours
This course covers concepts in enterprise resource planning (ERP). The main focus of this course is to show how ERP systems integrate business processes across functional areas and support business management and performance analysis. This course will also examine how ERP systems evolved from early computer systems and manufacturing, and will evaluate the benefits and costs of implementing an ERP system. Example software, such as SAP, will be used extensively to illustrate how ERP systems work. Learning will be emphasized through review of articles published in academic and professional journals; discussion of case studies focusing on problems and issues involving enterprise resource planning; application of various problem-solving algorithms such as in forecasting and inventory management; and working on a term project focusing on investigating a key enterprise resource management problem.
Prerequisite(s): OM 521 or IMSE 580 or EMGT 520
Restriction(s):
Can enroll if Class is Graduate

OM 666 Sustainable Supply Chain Mgmt 3 Credit Hours
This course describes various issues and problems encountered in designing and maintaining a supply chain that deals with environmental concerns of product disposal, and re-manufacturing. Various types of sustainable supply chains, such as green supply chain, reversible supply chain, closed-loop supply chain etc., will be discussed along with tools and techniques to design and manage them.
Prerequisite(s): (OM 521 or IMSE 580 or EMGT 520) and MIS 525
Restriction(s):
Can enroll if Class is Graduate

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Frequency of Offering

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Organizational Behavior (OB)

OB 510 Organization Behavior 3 Credit Hours
A survey course which provides a basic understanding of individual, inter-personal and group behavior in organizations, and its application in the practice of management. Topics include: personality and attitudes, motivation, groups and teams, leadership, power, ethics, structure and organizational design, culture, and decision-making.

Restriction(s):
Can enroll if Class is Graduate

OB 560 Management Skills Development 3 Credit Hours
To present the concepts, problems, and techniques of managing the human resources of an organization with emphasis on application and skill building. Topics include skills development for interviewing, counseling, and appraising employees; work team leadership and development of inter-group relationships, and conflict resolution.

Prerequisite(s): OB 510 or EMGT 545

OB 610 Intrnatl Dimensions of Managmt 3 Credit Hours
This course aims to provide a systemic review of international environmental forces and their influence on all management areas of corporate entities. Emphasis is placed on the issues confronting managers in international arenas as they attempt to plan, organize, staff and control global operations of multinational companies. The course will offer in-depth coverage of managing organizations in the global context, including issues related to cross-cultural management.

Prerequisite(s): OB 510 and BE 530 and MKT 515

OB 612 Org Change & Development 3 Credit Hours
To introduce theories, methods, and practice of organizational change and development; to provide a conceptual framework for examples of planned organizational change. Topics include: sub-processes in organizational change, intervention methods, sequencing and integration of change processes, change roles and role relations, change objectives and criteria.

Prerequisite(s): OB 510 or EMGT 545

An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

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Philosophy (PHIL)

PHIL 542 Medical Ethics 3 Credit Hours
Issues in medical ethics are among the most exciting and the most urgent in the world today. This course will explore some of these issues: the relationship between patient and health caregiver (truth-telling, informed consent, the right to refuse treatment, confidentiality); assisted suicide and euthanasia; treatment of defective newborns; scarce resources, social justice and the right to health care; cloning and genetic manipulation; new reproductive technologies; and others. We will discuss issues from the standpoint of patients, medical professionals, and citizens who shape policy in a democratic society. Ethical theories and concepts will be stressed. (F, YR)

Prerequisite(s): PHIL 240
Restriction(s):
Can enroll if Class is Graduate

Physics (PHYS)

PHYS 503 Electricity & Magnetism 3 Credit Hours
The study of electrostatics, magnetostatics, and electrodynamics using Maxwell’s equations. The course focuses on the development of Maxwell’s equations from observation and experiment and on the application of these equations to electromagnetic phenomena. Additional reading assignments and/or projects will distinguish this course from its undergraduate version PHYS 403. Students cannot receive credit for both PHYS 403 and PHYS 503. (W)

Prerequisite(s): (MATH 205 or MATH 215) and PHYS 151
Restriction(s):
Can enroll if Class is Graduate

PHYS 553 Quantum Mechanics 3 Credit Hours
A course in non-relative quantum mechanics emphasizing the basic postulates of quantum theory, the concepts of eigenstates and eigenvalues, and the role and use of operators and communication relations in the development of the subject. Application of the Schrodinger and Heisenberg formalisms to the solution of single-particle systems subject to a variety of potential functions, including simple step/barrier potentials, the harmonic oscillator potential and the Coulomb potential, will be made. Additional reading assignments and/or projects distinguish this course from its undergraduate version PHYS 453. Students cannot receive credit for both PHYS 453 and PHYS 553.

Prerequisite(s): MATH 216 and PHYS 305
Restriction(s):
Can enroll if Class is Graduate

PHYS 590 Topics in Physics 1 to 4 Credit Hours
Topics in Physics. (OC).
Restriction(s):
Can enroll if Class is Graduate

An asterisk denotes that a course may be taken concurrently.
Political Science (POL)

POL 513  American Constitutional Law  3 Credit Hours
A major theme of this course is the development of the constitution, especially focusing on the themes of judicial review, judicial self-restraint and judicial activism; the expansion of executive and legislative powers; and the rise of "substantive due process of law". Prerequisite or equivalent recommended. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Graduate

POL 514  Civil Rights and Liberties  3 Credit Hours
An analysis of the Bill of Rights and the 14th Amendment, with particular emphasis upon recent landmark or controversial Supreme Court decisions dealing with freedom of speech and religion, rights of criminal defendants; cruel and unusual punishment, right to privacy; civil rights and equal protection clause; and apportionment. Prerequisite or equivalent recommended. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Graduate

POL 517  Constitution & National Security  3 Credit Hours
This course focuses on the issue of national security and how the federal government has used power to protect its citizens. It analyzes relevant national security issues in order to understand how government action is constrained by the Constitution and social norms. The course examines the historical development of national security in the United States including habeas corpus, wiretapping, military tribunals, state secrets, and extraordinary rendition. Particular close attention is paid to the modern development of national security. The emphasis in reading will be on cases, executive orders, congressional hearings, and statutes. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Restriction(s):
Can enroll if Class is Graduate

POL 550  Revolution  3 Credit Hours
A consideration of violent political change and the conditions which promote it. The course covers both revolutionary theories and empirical research. Specific revolutions are considered. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. Students cannot receive credit for both POL 450 and POL 550. (YR).
Restriction(s):
Can enroll if Class is Graduate

POL 551  Peace and War  3 Credit Hours
An examination of the causes of war and the means of securing peace. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Restriction(s):
Can enroll if Class is Graduate

POL 560  Science, Tech & Pub Policy  3 Credit Hours
This course explores the intersection of science, technology, and public policy. Scientific knowledge and technological innovations are exceptionally powerful resources for policy-makers and for societies; they also pose great challenges and risks. This course will look at how science and technology affect the pursuit of policy goals in areas such as public health, environmental sustainability, economic growth, and national security. Students will not receive credit for more than one of POL 460, POL 560, and PPOL 560.

POL 566  Politics & Policies Soc Welfare  3 Credit Hours
FULL TITLE: The Politics and Policies of Social Welfare. The course examines the relationship between politics and public policy as related to the provision of social welfare programs in the United States.
Restriction(s):
Can enroll if Class is Graduate

POL 571  American Foreign Policy I  3 Credit Hours
American foreign policy in Western Europe, Russia, and Latin America. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (OC)
Prerequisite(s): POL 101 or POL 201
Restriction(s):
Can enroll if Class is Graduate

POL 573  International Security Affairs  3 Credit Hours
International Security is a branch of world politics concerned with the threats, primarily military in nature, to the peace and security of the nation, states, and the international community. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).
Prerequisite(s): POL 101
Restriction(s):
Can enroll if Class is Graduate

POL 574  Revitalizing Cities  3 Credit Hours
What have we done to address decline in city neighborhoods and downtowns? Why? How has it worked? Why? what's the hope for the future? This course uses a public policy lens to engage students in a quest for answers to these questions. (YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate

POL 587  Comparative Enviro Policy  3 Credit Hours
This course explores environmental policy as a result of political processes involving diverse participants and entailing movement through several stages – from defining an issue as an environmental problem to placing it on a political agenda and then receiving a response at domestic governmental or international levels. This course analyzes environmental issues from a cross-cultural and comparative perspective, with a particular attention given to political institutions, political change, levels of development, political culture, public participation, and international commitments that shape the nature and dynamics of environmental politics and policy in different countries. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research.
Restriction(s):
Can enroll if Class is Graduate
**POL 589**  Seminar in Urban Politics  3 Credit Hours
Selected topics in urban politics. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research.
**Restriction(s):**
Can enroll if Class is Graduate

**POL 590**  Topics in Political Science  1 to 3 Credit Hours
Problems and issues in selected areas of political science. Title changes according to content. Courses may be repeated when specific topic differs. (OC)

**POL 591**  Seminar in Political Science  3 Credit Hours
Selected topics in political science. Course may be repeated for credit when topics differ. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).
**Restriction(s):**
Can enroll if Class is Graduate

**POL 592**  Seminar in Political Analysis  3 Credit Hours
An advanced in-depth look at the problems and techniques of empirical research. Gives special attention to research design, data collections, measurement, and validity. Statistics for social scientists will also be covered. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (OC).
**Restriction(s):**
Can enroll if Class is Graduate

**POL 598**  Directed Studies  1 to 6 Credit Hours
Directed individual study of any subject agreed upon by the student and the instructor. May not duplicate a formal course offering. (F, S, W).

**POL 599**  Directed Studies  1 to 6 Credit Hours
Directed individual study of any subjects agreed upon by the student and the advising instructor, which shall not duplicate a formal course offering. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (F, W, S).
**Restriction(s):**
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

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**Professional Education (PDED)**

**PDED 505**  Sp Ed Legisln and Litigation  3 Credit Hours
Content traces the historical development of special education through landmark litigation and legislation, parent advocacy, and national economic and social needs. The provisions of federal and state special education mandates, judicial interpretations, and Michigan state guidelines regulating the delivery of educational and vocational services to persons with handicaps will also be addressed.
**Prerequisite(s):** EDC 501 or EDN 520
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

**PDED 515**  Museum Resources for Teaching  3 Credit Hours
Explores the use of museums as educational resources by elementary and secondary teachers. Various museums in the greater Detroit metropolitan area will be visited and studied. Students will review how to plan educational trips and how to use museum resources in meeting their own particular individual needs.
**Restriction(s):**
Can enroll if Class is Junior or Graduate
Can enroll if College is Education, Health, and Human Services

**PDED 516**  Internship in Museum Education  2 or 3 Credit Hours
The museum education internship will prepare students with the knowledge and skills they need to plan, implement, and evaluate educational and interpretive programs in the context of museums. The educational functions of museums will be explored. The students will apply their knowledge and experiences to K-12 instruction in the core content areas.
**Restriction(s):**
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
Can enroll if Level is Rackham or Graduate or Professional Development
Can enroll if College is Arts, Sciences, and Letters or Education, Health, and Human Services

**PDED 518**  Tchg Mid Sch Math/Spec Needs  1 to 3 Credit Hours
This course is intended to introduce students to the characteristics and assessment of persons with ASD, as well as the best practices related to educating students with Autism Spectrum Disorders (ASD). Specifically, students will learn evidence based practices for assessing students with ASD, creating an appropriate educational environment for students with ASD, and providing academic instruction and behavioral interventions to students with ASD in special education and general education settings. Instruction will emphasize specific assessment and teaching tools and behavior management principles and practices associated with educating K-12 student with ASD.
**Prerequisite(s):** EDD 512
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

**PDED 518A**  Topics in Education  2 Credit Hours
**TOPIC TITLE:** Application of Distance Learning. Overview of common types of distance learning covering advantages, disadvantages, and relative costs. Discussion of research regarding student achievement and satisfaction, learner characteristics, and necessary factors for success. Students demonstrate a videoconference lesson, create an internet lesson and write research for internet publication. This course is part of the Adult Instruction and Performance Technology program and activities are based on the Instructional Design Process.
**Prerequisite(s):** EDT 512 or EDT 400

**PDED 518B**  Topics in Education  1 Credit Hour
**TOPIC TITLE:** Transdisciplinary Teaming to Support students with Challenging Behaviors This course explores the concept of transdisciplinary teaming for the purpose of supporting children/youth with challenging behaviors. Topics of study in this course include multi-level systems for preventing and remediating inappropriate behaviors, school-wide, class-wide, and individual research-based interventions including Functional Behavior Assessment (FBA).
PDED 518S  The Educational Escape Room  1 Credit Hour
TOPIC Title: The Educational Escape Classroom: Participants will learn how to develop educational escape rooms that can be used to engage students in different content areas. Focus will be placed on crafting a relevant scenario, creating logical hints, and integrating the escape room activity into the curriculum. Participants will be introduced to a variety of tools and technologies that can be used to create escape room activities. (OC).

PDED 518U  Creating a Maker Space  1 Credit Hour
TOPIC Title: Creating a Maker Space: Participants will learn how to create a Maker Space within their own school or classroom. A variety of resources will be shared to help reduce the cost of developing a Maker Space. Participants will also learn about ways to design learning activities that utilize a Maker Space in order to advance the curriculum in different content areas. (OC).

PDED 518C  Topics in Education  2 Credit Hours
TOPIC TITLE: Teaching Geometry in Secondary School. This summer institute in geometry is modeled after the High School Teacher Program of the Park City Mathematics Institute. The high school teachers from Michigan who are involved in that program will lead sections which enhance teachers’ understanding of geometry topics relevant to the new standards, pedagogy that enhances student learning of geometry and the application of technology to the teaching of geometry. Students will complete a project based on the institute.

PDED 518D  Topics in Education  1 Credit Hour
TOPIC TITLE: Technology in Education - Module 1: Teaching and Learning with Basic Technology Skills. The primary focus will be to develop and utilize courseware and class management materials using the word processor, spreadsheet, database, and presentation applications.

PDED 518E  Topics in Education  1 Credit Hour
TOPIC TITLE: Technology in Education - Module 2: Teaching and Learning with the Internet. Participants will cover the basics of electronic communication, the use of the World Wide Web, the creation of Web pages and Web-based activities, and the issues related to the use of the Internet in schools.

PDED 518F  Studies in Education  1 Credit Hour
TOPIC TITLE: Technology in Education - Module 3: Teaching and Learning with Multimedia. Use of the computer to combine text, sound, video, still images, animation, and interactivity to create constructive problem solving will be covered.

PDED 518H  Studies in Education  1 to 2 Credit Hours
TOPIC: Intervention Strategies for Young Children with Disabilities. Participants will gain knowledge of ways to plan for and address individualized goals in early education settings. Emphasis will be on developing functional goals and objectives, intervening during classroom routines and activities, and using naturalistic strategies which promote language, social and cognitive development.

PDED 518I  Studies in Education  1 to 2 Credit Hours
TOPIC: Designing Instruction for the Internet. The course is designed for teachers who are competent in word processing and familiar with the Internet and web searches. Each teacher or graduate student will experience Internet learning through a guided lesson introducing them to UM-D’s electronic resources, various teacher oriented web-pages, sample Internet lessons, and guide them through an initial search for possible topics of their own Internet lesson.

PDED 518J  Studies in Education  1 to 2 Credit Hours
TOPIC: An Introduction to the Learning Cycle for Elementary and Middle School Science. This workshop will help teachers become acquainted with the Teaching and Learning Cycle for use in elementary and middle school science. The Learning Cycle is a model for teaching and learning that uses inquiry in and attempt the foster teaching for understanding. The Learning Cycle is an appropriate pedagogy for aligning pedagogy with the NSES, and, therefore the Michigan Goals and Objective in Science Education (MEGOS) on which the MEAP is derived.

PDED 518K  Studies in Education  1 to 2 Credit Hours
TOPIC: Positive Guidance Techniques for Classroom Management. This workshop will help teachers in early childhood education to apply positive guidance techniques in their classrooms. Strategies that actively promote prosocial behavior and that change inappropriate misbehavior will be discussed. Participants will develop methods of structuring a positive classroom atmosphere in order to facilitate appropriate social behavior, learn techniques to guide and directly teach positive social skills, and learn and practice conflict resolution strategies.

PDED 518M  Topics in Education  2 Credit Hours
This course will provide an intensive review of key concepts in economics, particularly microeconomic principles. This course will emphasize concepts, methods, and curriculum material that can be incorporated across disciplines and subject matter. Students will review material available from the National Council on Economic Education, services offered by the Michigan Council on Economic Education, and resources available from the University of Michigan-Dearborn Center for Economic Education. Students will review the Michigan Economics Standards and Indicators of Achievement and the Michigan Curriculum Framework. Students will create teaching units relevant to their students based on material from the course.

PDED 518S  Topics in Prof Educ Devl  1 Credit Hour
This course will provide students with the skills and knowledge to integrate technology in their instruction and administrative duties. Students will learn from practicing teachers, administrators and researchers about effective ways to create engaging and interactive learning environments through the use of a variety of technology tools. There will also be an emphasis on using technology for communication and to increase overall productivity.

PDED 518T  The Educator and the Law  1 to 2 Credit Hours
Designed to familiarize classroom teachers with school law and its implications for educators, pupils, and parents. Consideration will be given to the legal aspects of such matters as physical threats, teacher liability, codes of conduct, discipline and student rights.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Education, Health, and Human Services

PDED 705  SpEd Legislatn and Litigation  3 Credit Hours
Content traces the historical development of special education through landmark litigation and legislation, parent advocacy, and national economic and social needs. The provisions of federal and state special education mandates, judicial interpretations, and Michigan state guidelines regulating the delivery of educational and vocational services to persons with handicaps will also be addressed. Additional course work differentiates this course from the master's level.
Restriction(s):
Can enroll if Class is Specialist or Doctorate
Can enroll if College is Education, Health, and Human Services
Other Content
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Psychology (PSYC)

PSYC 505 Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 407. Students cannot receive credit for both PSYC 407 and PSYC 507. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

PSYC 507 Psychology of Adolescence  3 Credit Hours
Considers adolescence as an interaction of rapid biological and social change. Examines the theoretical and empirical literature in some detail. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 407. Students cannot receive credit for both PSYC 407 and PSYC 507. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 512 Psychology of Aging  3 Credit Hours
This course examines development of the individual from middle adulthood through old age. Special emphasis is given to the understanding of developmental theories and issues in adulthood. Topics include biological basis, socialization, family relationships, personality, and intellectual development in the aging individual. (F,W)
Restriction(s):
Can enroll if Level is Graduate

PSYC 515 Lab in Developmental Psych  3 Credit Hours
An examination of research design and methodology as related to developmental psychology. Special emphasis will be given to training students in data collection techniques used in developmental research and in providing practical experience in designing and conducting research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 415. Students cannot receive credit for both PSYC 415 and PSYC 515. (YR).
Prerequisite(s): PSYC 300 or PSYC 302 or PSYC 315 or PSYC 407 or PSYC 418 or PSYC 507 or PSYC 518
Restriction(s):
Can enroll if Class is Graduate

PSYC 518 Cognitive Development  3 Credit Hours
This course explores theories and methods in cognitive development focusing on Piaget's theory and more recent significant conceptualizations. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 418. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 522 Psychology of Leadership  3 Credit Hours
Analysis of theories and research findings in the field of leadership. Class will participate in and observe leadership-group interactions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 422. Students cannot receive credit for both PSYC 422 and PSYC 522. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 523 Multicultural Counseling  3 Credit Hours
This course will explore multicultural issues in counseling and clinical psychology. The central focus for this course will be ethnic and racial diversity, although attention will be given to gender, sexual orientation, age and socio-economic status as they relate to issues of diversity in counseling. Students will gain an appreciation of the complexities of the influence of culture on social, emotional, behavioral and cognitive development, and the major issues involved in assessment and treatment of diverse clients and their families. (F)
Restriction(s):
Can enroll if Class is Graduate

PSYC 530 Psychology in the Workplace  3 Credit Hours
This course introduces students to some of the core content areas of Industrial/Organizational (I/O) psychology. These content areas include: selection, training, performance appraisal, work teams, job design, motivation, leadership, union-management relations, and stress and health in the workplace. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4305. Students cannot receive credit for both PSYC 4305 and PSYC 530. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or OB 354 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 531 Organizational Entry  3 Credit Hours
An in-depth consideration of the psychological aspects of the organizational entry process. Topics include recruitment, selection, orientation, socialization, and training. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both PSYC 431 and PSYC 531. (OC).
Prerequisite(s): PSYC 170* or HRM 405* or PSYC 171*
Restriction(s):
Can enroll if Class is Graduate

PSYC 532 Socialization of the Child  3 Credit Hours
An in-depth consideration of some major social systems that affect the development of the child. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 432. Students cannot receive credit for both PSYC 432 and PSYC 532. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate
PSYC 540 Abnormal Psychology 3 Credit Hours
An introduction to the field of psychopathology, the study of mental disorders. Includes exposure to a number of historical and theoretical perspectives, each with their own theories, methodological, and treatment approaches. Disorders covered will include: anxiety and mood disorders, personality disorders, schizophrenia, sexual disorders, and psychosomatic disorders. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 440. Students cannot receive credit for both PSYC 440 and PSYC 540. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 542 Child Psychopathology 3 Credit Hours
A review of the major psychological disorders of children from birth to adolescence. These disorders are considered from a clinical and theoretical point of view. In addition to an examination of causes, approaches to treatment and behavior modifications are considered. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 442. Students cannot receive credit for both PSYC 442 and PSYC 542. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 544 Personality Assessment 4 Credit Hours
This is a course in methods of assessing personality. The theory and methods of observation, interviewing, and psychological testing are discussed and then employed in brief, individually-designed studies. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4445. Students cannot receive credit for both PSYC 4445 and PSYC 544. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 545 Advanced Psychopathology 3 Credit Hours
This course is designed for graduate students who require an advanced knowledge of psychological disorders and their diagnosis. Course content includes an overview of the symptoms, etiology, and treatment alternatives for major psychological disorders. The emphasis includes both an overview of research based knowledge and practical application of the current diagnostic system.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate
Can enroll if College is Arts, Sciences, and Letters
Can enroll if Program is MS-Psychology

PSYC 546 Human Sexual Behavior 3 Credit Hours
A comprehensive review of facts about human sexuality. The emphasis is on psychological aspects of sex, but there is also a consideration of genetic, physiological, and anatomical aspects of sex, and contemporary issues. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 446. Students cannot receive credit for both PSYC 446 and PSYC 546. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 547 Therapeutic Intervention 4 Credit Hours
This course provides an introduction to the theories, practice, and ethical issues in clinical psychology. The emphasis is on the application of psychotherapeutic processes. Topics include ethical practices, formation of a therapeutic relationship, use of basic counseling skills, differing clinical orientations, and a review of relevant research. (W)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Program is MS-Psychology

PSYC 548 Psychological Assessment I 4 Credit Hours
This course is the first of a two-course sequence for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of interviewing, behavioral observations, and personality tests used in clinical practice. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. Only individuals admitted to the Clinical Health Psychology program can enroll. (S,YR)
Prerequisite(s): PSYC 545
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 549 Psychological Assessment II 4 Credit Hours
This course is the second of a two-course sequence designed for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of tests and measures used in clinical practice, particularly those used in the assessment of intelligence, achievement, adaptive behavior, and child evaluation. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. (F)
Prerequisite(s): PSYC 545
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 550 Personality Theory 3 Credit Hours
A comparative review and examination of leading theories of personality, their basic concepts, similarities and differences, applications in clinical psychology, in education, social planning and in research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 450. Students cannot receive credit for both PSYC 450 and PSYC 550. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 552 Adv Tech in Therapeutic Inter 3 Credit Hours
This course introduces clinical health psychology graduate students to the theory and application of cognitive-behavioral therapy and mindfulness therapies. The course is aimed at providing students with a thorough understanding of the theory behind these modalities, as well as the experiential application of the associated therapy techniques in a clinical setting.
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Program is MS-Psychology
PSYC 555  Health Psychology  3 Credit Hours
A discussion of the research on health promotion, psychological factors in the development of illness, cognitive representations of health and illness, stress and coping, social support, nutrition and exercise. Focus will be on the factors related to the development and maintenance of optimal health. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 557  Advanced Health Psychology  3 Credit Hours
This course will examine the research on psychological factors associated with the development and/or progression of illness, as well as psychological and social factors in health promotion. Topics include cognitive and social representation of health and illness, stress and coping, factors and interventions for behavioral change and the development of healthy lifestyles, and the treatment of psychological and behavioral risk factors for illness.
Restriction(s):
Can enroll if Class is Graduate

PSYC 561  Learning and Memory  3 Credit Hours
A consideration of major theories and research results related to learning and memory. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 461. Students cannot receive credit for both PSYC 461 and PSYC 561. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 563  Sensation and Perception  3 Credit Hours
Analysis of basic sensory and perceptual phenomena with a review of relevant behavioral and physiological literature. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 463. Students cannot receive credit for both PSYC 463 and PSYC 563. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 564  Applied Cognitive Psych  3 Credit Hours
The focus will be on the application of principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language. (S,YR)

PSYC 565  Ind&Grp Tech in Cln Hlth Psyec  3 Credit Hours
An introduction to the variety of assessment and intervention procedures used by health psychologists in medical settings; issues in medical consultation and liaison. Techniques discussed fall in areas such as stress management, smoking cessation, weight management, and the treatment and prevention of cardiovascular disease, cancer, and HIV/AIDS. The theoretical, conceptual, and empirical bases of intervention will be stressed. Prerequisites required or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Class is Graduate

PSYC 570  Advanced Physiological Psych  3 Credit Hours
Further study of the subject matter of PSYC 431. Advanced study of topics in the area of psychology. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 470. Students cannot receive credit for both PSYC 470 and PSYC 570. (YR).
Prerequisite(s): PSYC 370
Restriction(s):
Can enroll if Class is Graduate

PSYC 571  Reproductive Physio & Behavior  3 Credit Hours
An in depth examination of reproduction from a physiological viewpoint. Physiological topics include anatomy, hormones, and neural mechanisms. Psychological topics include behavior development and descriptions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 471. Students cannot receive credit for both PSYC 471 and PSYC 571. (YR)
Prerequisite(s): PSYC 170 or PSYC 101 or PSYC 171
Restriction(s):
Can enroll if Class is Graduate

PSYC 572  Motivation and Behavior  3 Credit Hours
Study of the psychobiological aspects of motivated behavior. Topics include hunger, addiction, aggression, sleep, and achievement. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 472. Students cannot receive credit for both PSYC 4725 and PSYC 572. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 574  Animal Learning and Cognition  3 Credit Hours
Animal Intelligence involves the study of human and non-human animal behavior and cognition in an evolutionary and comparative framework. As an introduction to human and non-human animal cognition and thought processes this course will examine topics such as problem-solving, spatial cognition, categorization, memory, number concepts, tool-use and tool-production, insight, imitation, social cognition, self-recognition and language(like) behavior. In addition to discussing basic experimental findings about cognition in animals, an emphasis is placed on the logic and evidence used to justify theoretical conclusions. The course requires reading and critiquing original journal articles in addition to textbook chapters for foundational concepts.
Prerequisite(s): PSYC 372 or PSYC 363 or PSYC 461 or BIOL 419 or BIOL 456 or ANTH 336
Restriction(s):
Can enroll if Class is Graduate

PSYC 570  Bio Foundations of Health Psyec  3 Credit Hours
Advanced study of the anatomical, physiological, and chemical correlates of behavior and mental processes, including the relationships among brain and body function/structure (neurochemistry, histology, anatomy), psychological variables (motor behavior, motivation, emotion, perception, learning, memory), health, and mental and physical illness. Integrates experimental and clinical research methodologies. Prerequisites or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 555 or PSYC 455 or PSYC 557
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate
PSYC 5825  Basic Methods Health Psych  3 Credit Hours
This course assumes a basic background in statistics and methodology and builds from there, with special emphasis on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 5835  Adv Methods Health Psych  3 Credit Hours
As a continuation of PSYC 5825, this course assumes a more advanced background in statistics and methodology. The course focuses on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include survey research, program evaluation, epidemiological research, qualitative research, MANCOVA, multiple regression, logistic regression, cluster analysis, and meta-analysis. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Prerequisite(s): PSYC 5825
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 584  Research Methods in Beh Med  3 Credit Hours
This course introduces graduate health psychology students to laboratory based research methods typically used in behavioral medicine. The focus is on laboratory methods of cardiovascular and pain research, specifically cardiovascular reactivity, heart rate variability, acute and chronic pain responses. The class also includes several special topics related to health psychology research (e.g., skin conductance, cortisol sampling, etc.). Students are responsible for physical implementation of research protocols, data analysis, and presentation of research findings.
Prerequisite(s): PSYC 557
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 585  Psychology Internship  3 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, developmental disabilities, geriatrics, human resources/staff development, probation departments, teenage runaways, substance abuse, and women’s issues. The program involves training in listening and helping skills. Written permission of instructor is required. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 485. (F,W).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 588  Primatology Field Course  3 Credit Hours
This Primatology Field course will take students through an exploration of the scientific approach and methodology to the study of animal behavior. Students will gain experience in creating research projects and collecting data on free-ranging animals in a naturalistic environment. Preparation in lectures and activities on the campus of The University of Michigan-Dearborn will include learning about observational methods in detail, practicing developing ethograms and operational definitions, pilot data collection to modify the ethograms at the Detroit or Toledo Zoo, and use of GPS for data collection. Lecture materials will also cover topics of primate behavior and ecology. Students will spend a week observing a primate species (for example, one possible site for this field course may be to observe free-ranging lemurs at a reserve in Florida). Student’s data collection at the field site will be for five continuous days. This field course provides a unique opportunity to study rare and endangered primates species in a safe and accessible environment. Short day trips to other facilities are possible, such as a visit to an ape sanctuary. Topics covered in this field course include advanced observational methods stemming from the field of Ethology, practical development of ethograms (checksheets) and research design, best practices in GPS data collection methods, and collating and summarizing data on animal behavior into a research paper. Lecture topics will address ethological methods and research design and also how to conduct research with free-ranging nonhuman primates. In addition there will be a strong focus on health and safety precautions in the field for human and nonhuman primates, acclimation to the field site, and practicalities of data collection. For graduate credit on this course, extra journal articles and longer written papers required than for the undergraduate requirements.
Restriction(s):
Cannot enroll if Class is Freshman

PSYC 590  Adv Topics in Psychology  1 to 3 Credit Hours
This course provides an introduction to the field of psychoneuroimmunology. This area of study is concerned with the multidirectional communication between psychological processes such as stress or depression and central/peripheral nervous system, endocrine system, and immune system functioning. Ultimately, this field seeks to understand the relative contribution of psychological processes to traditional disease states (cardiovascular disease, pregnancy complications, etc). Students will learn the basic functioning of the immune system, and pathways via endocrine and nervous system functioning by which psychological processes influence immune functioning. Finally, students will learn the current state of research examining the relationship between psychological processes and disease outcomes. Students cannot receive credit for both PSYC 590 and PSYC 490.
Prerequisite(s): PSYC 455 or PSYC 555
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 590E  Advanced Topics in Psychology  2 Credit Hours
This course focuses on Advanced Topics in Psychology: Research and Clinical Ethics. Provides graduate psychology students with extended examination of current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching.
PSYC 592 Individual Research 1 to 3 Credit Hours
No more than 6 hours may be counted for concentration. Arrangements will be made for adequately prepared students to undertake individual research under the direction of a member of the staff. The students, in electing, should indicate the staff member with whom the work has been arranged. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 492. Students cannot receive credit for both PSYC 492 and PSYC 592. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 593 Ethical Issues 3 Credit Hours
Provides graduate psychology students with current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching. (F,YR)
Restriction(s):
Can enroll if Class is Graduate

PSYC 697 Health Psych Thesis Research 3 to 6 Credit Hours
Students electing the Thesis option in the last stage of the Master of Science in Health Psychology program will work under the general supervision of a member of the graduate faculty in the Behavioral Sciences Department but will plan and carry out the work independently. A prospectus for the thesis must be approved by the Master of Science in Health Psychology program director before the student registers for the course. The student will submit a report on the thesis and give an oral presentation to a panel of faculty members when the thesis is completed. (YR)
Restriction(s):
Can enroll if Class is Graduate

PSYC 698 Pract. Clinical Health Psych 3 to 6 Credit Hours
The Practicum in Clinical Health Psychology offers students supervised clinical experience in a variety of clinical health and human service settings. The practicum is designed for students in the MS in Clinical Health Psychology program who have completed all coursework related to clinical diagnoses, assessment and therapy. Written permission of instructor or Program Director required.
Prerequisite(s): PSYC 545 and PSYC 547 and PSYC 548 and PSYC 549 and PSYC 565 and PSYC 593
Restriction(s):
Can enroll if Program is MS-Psychology

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F,W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Public Administration and Public Policy (PAPP)

PAPP 500 Topics in Pub Admin & Policy 1 to 3 Credit Hours
This course will examine a major topic or set of related topics in public administration and/or public policy. The topics may change and, therefore, it is possible to take the course more than once. (OC)
Restriction(s):
Cannot enroll if Level is Graduate

PAPP 502 Politics of Public Policy 3 Credit Hours
This course explores how public policy is made in the United States, with a special emphasis on inter-relationship of policy and politics. We examine how political and other variables converge to create an often maddening, but inescapable, set of contradictions (a.k.a. paradoxes) that both hamper rationality and enable sustainability of our governmental systems. Policy and politics are inseparable. This course will help you understand why and assess the benefits and disadvantages of this reality. (W,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 505 Intro to Public Admin 3 Credit Hours
This introductory course provides an overview of topics encountered in government or nonprofit administrator positions. Topics emphasized in the seminar include decision making, finance, human resource, leadership, performance, accountability, organizational responsiveness, and strategic management. (F,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 520 Govt & Nonprofit Leadership 3 Credit Hours
This course examines the complex but critical top of leadership in public affairs. It examines leadership theories, styles, and practices and how these affect the way that public and nonprofit organizations operate. (FAY)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 523 Administrative Law 3 Credit Hours
This class will focus on important legal and regulatory issues as they relate to public, education, and nonprofit organizations. It will consider the various court and administrative decisions which affect these. Numerous case situations will be used to facilitate the students’ learning.
Restriction(s):
Can enroll if Level is Graduate

PAPP 527 Pub Relations for Govt/Nonprof 3 Credit Hours
This seminar explores the interaction of government and nonprofit organizations with the public. It is particularly concerned with the way these organizations communicate with citizens and organizations and engage them in their operations and decision-making. (S,AY)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 537 Behavioral Public Policy 3 Credit Hours
This course teaches you to apply the insights from behavioral economics and psychology to public policy design. Empirically-based behavioral science offers policy makers the opportunity to decrease the impact of psychological limitations of lazy or boundedly rational individuals. In this course we consider various public policies that are informed by behavioral science research in the areas of retirement savings, household borrowing, health care, energy use and choice of nutrition. (S,AY)
Prerequisite(s): ECON 201 and ECON 202
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 537 Behavioral Public Policy 3 Credit Hours
This course teaches you to apply the insights from behavioral economics and psychology to public policy design. Empirically-based behavioral science offers policy makers the opportunity to decrease the impact of psychological limitations of lazy or boundedly rational individuals. In this course we consider various public policies that are informed by behavioral science research in the areas of retirement savings, household borrowing, health care, energy use and choice of nutrition. (S,AY)
Prerequisite(s): ECON 201 and ECON 202
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 540 Government & Nonprofit Finance 3 Credit Hours
This course provides a critical understanding of finance for governmental and nonprofit organizations. Students examine how revenue is derived and spent, how organizations craft and manage budgets, and how accounting and financial reporting aid operations and transparency. Special attention is given to the ways in which the publicness of government and nonprofit organizations creates significant differences between their finances and those of business. (F, W)
PAPP 545  **Grant Writing & Management**  3 Credit Hours
This course prepares students planning careers in public and nonprofit organizations to win and manage grants for their organization. Students will learn how to research and identify strong grant prospects, build relationships with foundation program officers, draft letters of intent and full proposals, and manage grant funds once they are received. Students will also become familiar with public sector risk management associated with grant stewardship. (S,YR)

Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 548  **Fundraising**  3 Credit Hours
The course will analyze the role of fundraising and philanthropy for nonprofits. The class will examine issues such as the cultural, political and economic supports and constraints within which nonprofit organizations operate. Students will be able to enhance their fundraising skills and their knowledge of the fundraising practices of nonprofits.

Restriction(s):
Can enroll if Level is Graduate

PAPP 550  **Network Collaboration**  3 Credit Hours
This course focuses on collaboration as a form of service delivery by government and nonprofits. It examines different types of collaboration across sectors, focusing on collaborative governance. Emphasis is placed on practical skills such as designing, managing, and evaluating collaborations, but critical conceptual aspects of network collaboration are also addressed. NOTE: The online course may require some synchronous participation in simulations and group exercises; dates and time will be determined by student groups. (GR)

Restriction(s):
Can enroll if Class is Graduate

PAPP 560  **Admin of Human Resources**  3 Credit Hours
This seminar will examine human resource administration activities in public, educational and nonprofit settings. Issues such as recruiting, selection, planning, performance appraisal, contracting and collective bargaining will be related to the overall administrative activities. Emphasis will be placed on the connections between human resource issues in public, education, and nonprofit organizations.

Restriction(s):
Can enroll if Level is Graduate

PAPP 561  **Organization Develop & Theory**  3 Credit Hours
This course focuses on organizational change. Students will learn why and how organizations pursue planned change to improve outcomes. They will explore topics of organization theory, such as organization culture, structure, power, and environmental influences on organizations, as well as behavioral science theories on individual and group behavior. Students will apply this knowledge in examining specific techniques used to stimulate and guide organizational change. (F,W)

Restriction(s):
Can enroll if Level is Graduate

PAPP 562  **Govt & Nonprof Labor Relations**  3 Credit Hours
The seminar considers conceptual and practical aspects of management-labor relations in public and nonprofit settings, with an emphasis on labor unions, collective bargaining, and civil service. It also develops initial competency in the various activities associated with collective bargained situations. (OC)

Restriction(s):
Can enroll if Level is Graduate

PAPP 564  **Performance**  3 Credit Hours
Evaluating the performance of employees is crucial to the motivation of the individual and the success of the organization. Evaluating the performance of organizations helps leaders direct resources to areas where they can have the most impact. This class will consider the available methods for assessing individual and organizational performance in public and nonprofit settings. (S,YR)

Restriction(s):
Can enroll if Level is Graduate

PAPP 565  **Stat Method for Decisionmaking**  3 Credit Hours
This course introduces students to descriptive and basic inferential statistics and how organizational leaders can use them to aid decision making. (F,W)

Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 566  **Strategic Mgt for Pub Admin**  3 Credit Hours
This course examines concepts, tools, and actions used by administrators to ensure that their organizational resources are continually devoted to accomplishing the organization's mission. Crafting and communicating effective missions and visions, developing and implementing strategic plans, measuring & assessing performance, monitoring environmental influences, conducting needs assessments, and incorporating mission-oriented criteria into financial and human resources management are examples of the topics covered. (S,Y)

Restriction(s):
Can enroll if Level is Graduate

PAPP 568  **Program Evaluation**  3 Credit Hours
This course prepares students planning careers in public and nonprofit organizations to do an ongoing evaluation of the impact of the programs funded in the areas where they can have the most impact. This class will consider the available methods for assessing performance in public and nonprofit settings. The concern will be to examine the various techniques available to determine whether or not a program is doing what it was intended to do. (W,Y)

Restriction(s):
Can enroll if Level is Graduate

PAPP 569  **Revitalizing Cities**  3 Credit Hours
What have we done to address decline in city neighborhoods and downtowns? Why? How has it worked? Why? What's the hope for the future? This course uses a public policy lens to engage students in a request for answers to these questions. (Y)

Restriction(s):
Can enroll if Level is Graduate

PAPP 580  **Grant Writing & Management**  3 Credit Hours
This course considers procedures for evaluating programs in public and nonprofit settings. The concern will be to examine the various techniques available to determine whether or not a program is doing what it was intended to do. (W,Y)

Restriction(s):
Can enroll if Level is Graduate

PAPP 581  **Strategic Mgt for Pub Admin**  3 Credit Hours
We examine the role of fundraising and philanthropy for nonprofits. The class will examine issues such as the cultural, political and economic supports and constraints within which nonprofit organizations operate. Students will be able to enhance their fundraising skills and their knowledge of the fundraising practices of nonprofits.

Restriction(s):
Can enroll if Level is Graduate

PAPP 582  **Policy Analysis & Development**  3 Credit Hours
We examine the role of information in policy development for the public and organizations paying particular attention to analytical strategies and tools, stages in the policy process where they can be incorporated, and strategic approaches for maximizing the likelihood of impact. (W,Y)

Restriction(s):
Can enroll if Level is Graduate

PAPP 583  **Program Evaluation**  3 Credit Hours
This course examines procedures for evaluating programs in public and nonprofit settings. The concern will be to examine the various techniques available to determine whether or not a program is doing what it was intended to do. (W,Y)

Restriction(s):
Can enroll if Level is Graduate

PAPP 584  **Revitalizing Cities**  3 Credit Hours
We examine strategies and practices used by government and nonprofit administrators to plan for and manage technology effectively within their organizations. (OC)

Restriction(s):
Can enroll if Level is Graduate
PAPP 586  Ethics of Admin & Public Pol  3 Credit Hours
This course critically examines ethical issues encountered by public administrators and policymakers. It examines ethical considerations related to managing people and other organizational resources and designing and implementing public policy. It seeks to help students identify, understand, and deal effectively with the ethical dimensions of leadership in the public and nonprofit sectors. (F,W)
Restriction(s):
Can enroll if Level is Graduate

PAPP 650  Admin & Policy Capstone  3 Credit Hours
This "capstone" seminar involves the assessing MPAP degree candidates' knowledge, skills and abilities in core program areas. Students complete capstone projects, finalize and present professional portfolios, and assess their experience in the MPAP program. (F,W)
Restriction(s):
Can enroll if Level is Graduate

PAPP 690  Direct Study in Pub Adm/Policy  1 to 3 Credit Hours
This course will permit students to explore subjects not currently offered in regular course but within the capacity of existing faculty and under that faculty member's supervision. To be elected only with the permission of the program director and an instructor. (OC)
Restriction(s):
Can enroll if Level is Graduate

PAPP 720  Pub Admin/Policy Internship  1 to 3 Credit Hours
Students who lack the necessary experience in responsible administration will be afforded the opportunity to gain the experience in the internship. The class and the number of hours will be arranged to fit the needs of the students as determined by their advisors. Credits for this course do not count towards the minimum credits required for core or elective courses to complete the MPAP program. (F,W,S)
Restriction(s):
Can enroll if Level is Graduate

Religious Studies (RELS)

RELS 501  Religion in Contemp US Culture  3 Credit Hours
The purpose of this course is to provide people in contemporary multi-religious America foundational information about beliefs and practices of several of the world's religions sufficient to engage in inter-religious dialogue. Special emphasis will be given to changes in the American religious landscape after 1965 with the passage of new immigration laws. The course will combine lectures and visits to a variety of Metropolitan Detroit religious centers including Hindu, Buddhist, Jain, Sikh, Jewish, Christian, Muslim, and Native American. (YR,S).
Restriction(s):
Can enroll if Class is Graduate

*  An asterisk denotes that a course may be taken concurrently.

Social Sciences (SSCI)

SSCI 585  The Middle East for Teachers  2 Credit Hours
This is an orientation and curriculum development course for teachers who a) include the Middle East in their curriculum or b) have students of Middle Eastern background and would like to know more about the region.
Restriction(s):
Can enroll if Class is Graduate

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Sociology (SOC)

SOC 503  Minority Groups  3 Credit Hours
The status of racial and ethnic minorities in the United States with particular reference to the social dynamics involved with regard to majority-minority relations. Topics of study include inequality, segregation, pluralism, the nature and causes of prejudice and discrimination and the impact that such patterns have upon American life. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 403. Students cannot receive credit for both SOC 403 and SOC 503. (AY)
Prerequisite(s):
SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 504  Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This class examines the unequal distribution of power - social, economic, and political - in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We'll look at ways that beliefs and practices, like viewing inequality as consequence of a 'natural order', obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors, and ideologies that maintain discrimination and the unequal distribution of power and resources. Students will not receive credit for both SOC 404 and SOC 504. This course is distinguished from its 400-level counterpart by the requirement of additional assignments, including a required additional paper.
Restriction(s):
Can enroll if Class is Graduate
**SOC 509 Feminist Theories  3 Credit Hours**
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women's and men's lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Students will not receive credit for both SOC 409 and SOC 509. Additional reading assignments or projects will distinguish this course from its undergraduate version.

**Prerequisite(s):** JIBS 560

**SOC 510 Quantitative Research & Stats  4 Credit Hours**
An introduction to methods of data collection and analysis. Also a discussion of research design and the philosophy of social sciences. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 410. Students cannot receive credit for both SOC 410 and SOC 510. (F,W,S)

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 511 Program Evaluation  3 Credit Hours**
The application of social research procedures in assessing whether a human service program is needed, likely to be used, conducted as planned and actually helps people in need. The course will cover research and measurement as well as issues of how to get research findings utilized. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 411. Students cannot receive credit for both SOC 411 and SOC 511. (YR)

**Prerequisite(s):** SOC 200 or SOC 201 or PSYC 170 or PSYC 171 or POL 101 or PSYC 101

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 523 American Social Classes  3 Credit Hours**
Stratification of American communities and society; a review of the findings of major studies and an introduction to methodology. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 423. Students cannot receive credit for both SOC 423 and SOC 523. (YR)

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 526 Society and Aging  3 Credit Hours**
Personal, interpersonal, and institutional significance of aging and age categories. Sociological dimension of aging based on social, psychological, and demographic factors. Attention to social networks and institutionalization. Additional assignments or projects will distinguish this course from its undergraduate version SOC 426. Students cannot receive credit for both SOC 426 and SOC 526. (YR)

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 533 Race/Ethnic Health  3 Credit Hours**
Full Course Title: Race, Ethnicity and Community Health This course provides a broad overview of health disparities in the United States, with a focus on the three types of social inequality-race ethnicity (and nativity status), socioeconomic status (SES), and gender. Epidemiological issues, health behaviors, health care services, and health and social issues specific to various minority populations in the U.S. are covered. The underlying position of the course is that understanding groups that are at higher risk of developing poor health outcomes is crucial to developing better health care and health policy interventions. (OC)

**SOC 535 Urban Sociology  3 Credit Hours**
A descriptive study of the form and development of the urban community with respect to demographic structure, spatial and temporal patterns, and functional organization. The relationship of city and hinterland. Social planning and its problems in the urban community. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 435. Students cannot receive credit for both SOC 435 and SOC 535. (YR)

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 540 Medical Sociology  3 Credit Hours**
An analysis of health and illness behavior from the point of view of the consumer, as well as the medical professionals, the structure, strengths, and weaknesses of the medical care delivery system in the U.S.; the impact of culture and personality on illness behavior; and a study of the institution of medicine and activities of health care professionals. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 440. Students cannot receive credit for both SOC 440 and SOC 540. (F,W,S)

**Prerequisite(s):** SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 542 Sociology of Work  3 Credit Hours**
The study of work roles in modern society. The impact of industrialization, professionalization, and unionization on the conditions of work, worker motivation and job satisfaction. Career choice processes and career patterns, occupational status and prestige, and occupational associations are among the topics to be considered. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 442. Students cannot receive credit for both SOC 442 and SOC 542. (YR)

**Prerequisite(s):** SOC 201 or SOC 200

**Restriction(s):**
Can enroll if Class is Graduate

**SOC 543 Gender Roles  3 Credit Hours**
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 443. Students cannot receive credit for both SOC 443 and SOC 543. (YR)

**Prerequisite(s):** PSYC 170 or PSYC 171 or SOC 200 or SOC 201

**Restriction(s):**
Can enroll if Class is Graduate
SOC 545  The Family  3 Credit Hours
The family is an institution shaped by other aspects of society, as a social system with its own dynamics, and as a primary group affecting the lives of its members. Historical and contemporary materials from the United States and other cultures. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 445. Students cannot receive credit for both SOC 445 and SOC 545. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 546  Marriage and Family Problems  3 Credit Hours
A sociological analysis of problems encountered within the institution of marriage with particular reference to such issues as choosing a marriage partner, sexual adjustment, occupational involvement, conflict resolution, child rearing, divorce and readjustment. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 446. Students cannot receive credit for both SOC 446 and SOC 546. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 547  Family Violence  3 Credit Hours
Sociological analyses of various forms of family violence which occur disproportionately in the lives of girls and women. Topics such as incest, sexual abuse, date rape, wife battering, and elder abuse will be situated within the social and cultural context of contemporary gender relationships. Social and political responses to the phenomena will be examined. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 447. Students cannot receive credit for both SOC 447 and SOC 547. (YR)
Prerequisite(s): SOC 200 or SOC 201 or SOC 301 or SOC 443 or PSYC 405 or WST 405 or PSYC 505 or WST 505 or SOC 543
Restriction(s):
Can enroll if Class is Graduate

SOC 548  Comparative Health Care System  3 Credit Hours
An introduction and overview of the English, Swedish, and People's Republic of China health care systems. Focus on cultural and other organizational characteristics, unique features, approaches and ability to solve problems. Emphasis on how the three systems help us understand the American health care system. Additional reading assignments or projects will distinguish this course from its undergraduate version HPS 448. Students cannot receive credit for both HPS 448 and HPS 548. (F, S, W).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 549  Political Sociology  3 Credit Hours
Examines how society affects the distribution and exercise of power through analyzing linkages between power, participation, and perspectives. Studies of political participation and social organization, ideology, and social conflict, as well as political socialization, represent some of the major parameters. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 450. Students cannot receive credit for both SOC 450 and SOC 550. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 553  Sociology of Law  3 Credit Hours
Various aspects of the relationship between law and society are explored. After a look at processes of law-making, attention is turned to the administration of law. This involves a study of the activities of legislatures, courts, police and correctional agents. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 453. Students cannot receive credit for both SOC 453 and SOC 553. (YR)
Prerequisite(s): SOC 200 or SOC 201 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

SOC 554  Mental Health and the Law  3 Credit Hours
Courts and legislatures now control much of the work of mental health professionals such as social workers, counselors, therapists, and psychologists. This course looks at problems encountered in putting laws and policies into effect. These implementation problems are much the same in other areas of government action, such as poverty programs and pollution control. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 454. Students cannot receive credit for both SOC 454 and SOC 554. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 555  Sociology of Religion  3 Credit Hours
Religion as a social institution; its purposes, methods, structures, and beliefs, and its relation to other institutions. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 455. Students cannot receive credit for both SOC 455 and SOC 555. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 556  Health Care and the Law  3 Credit Hours
Sociological study of legal issues in health care, including regulation of hospitals, consent for treatment, confidentiality, experimentation, family planning, children's rights, access to health care and other topics. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 456. Students cannot receive credit for both SOC 456 and SOC 556. (AY)
Prerequisite(s): SOC 200 or SOC 201 or POL 364
Restriction(s):
Can enroll if Class is Graduate

SOC 558  Sociology of Education  3 Credit Hours
Education as a social institution; its purpose, methods, structure, and philosophy, and its relation to other institutions, particularly in the urban setting. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 458. Students cannot receive credit for both SOC 458 and SOC 558. (AY)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate
SOC 560  America in a Global Society  3 Credit Hours
Social studies in America are studied from an internal and an external perspective. The internal dynamics of social change emphasize the role of social movements, e.g. the impact of the civil rights movement on American culture and politics. The external perspective sees America as part of a changing global society. The development of the capitalist world system from its origins in Western Europe to its present global reach is examined. Contemporary American social problems are examined in relation to America's position in a rapidly changing world. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 460. Students cannot receive credit for both SOC 460 and SOC 560. (OC)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 565  Deviant Behavior/Soc Disorganz  3 Credit Hours
A general analysis of the concept of social deviance and social disorganization: factors producing each condition, the effects of social control measures on the course of deviance and disorganization, consequences for the social system, and the relationship between the two. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 465. Students cannot receive credit for both SOC 465 and SOC 565. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 566  Drugs, Alcohol, and Society  3 Credit Hours
Analyses of the sociology of substance use and abuse. Provide a sociological framework for understanding issues and evaluating our nation's responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American Society. Additional assignments will distinguish this course from its undergraduate version.
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 569  Juvenile Delinquency  3 Credit Hours
The analysis of juvenile delinquent behavior in relationship to the institutional framework of society. Emphasis on the extent, causes, and methods of treatment of juvenile delinquency in the United States. Additional reading assignments or projects will distinguish this course from its undergraduate version, SOC 469. Students cannot receive credit for both SOC 469 and SOC 569. (YR).
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 579  Comparative Hlth Systems:Trip  3 Credit Hours
A unique combination of lectures, field trips, visits with general practitioners, specialists, hospital observations, talks with health policy planners, researchers, and many others. Personal experience in two health care systems. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 479. Students cannot receive credit for both SOC 479 and SOC 579. (AY)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 581  Gender and Globalization  3 Credit Hours
Mass media, politics, and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implication of globalization for women's lives, gender relations, and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism, and environmental challenges. Rather than survey international women's movements, this course explores how globalization reformulates identities and locations and the political possibilities they create. Students cannot receive credit for both SOC 481 and SOC 581. (AY).
Restriction(s):
Can enroll if Class is Graduate

SOC 583  Images of Organizations  3 Credit Hours
Formal bureaucratic organizations such as government agencies, hospitals, and colleges are distinctive features of modern industrialized societies. Analysis of types of formal organizations, their goals, structure, and consequences for intra- and inter-organizational behavior helps to understand how to deal with a complex world. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 483. Students cannot receive credit for both SOC 483 and SOC 583. (YR)
Prerequisite(s): SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

SOC 590  Advanced Topics in Sociology  3 Credit Hours
A seminar in which selected topics pertaining to sociology are studied in depth. (YR).
Restriction(s):
Can enroll if Class is Graduate

SOC 590A  Advanced Topics in Sociology  3 Credit Hours
TOPIC: Diasporas and (Trans) Nationalism: Gender, Race, and Post/Coloniality. An interdisciplinary and comparative inquiry into historical & contemporary linkages between gender regimes, national formations, and legacies of colonialism as they interact at "home" and in "diasporas." Using multi-media and multi-genre pedagogical tools (conceptual and methodological writings; narratives and biographies; guest lectures; films), we study & critique different perspectives on how the dialectics of geography, positionality, and social structures shape the ways in which we imagine "home", "homeland", and "back home." We examine gendered politics of the colonial project 1) in early days of colonization; 2) during struggles of decolonization; and 3) "post-colonial" geographies' While becoming familiar with "classics" in nationalism/transnationalism, gender, colonialism, and diaspora, we will explore their applicability to specific case studies in European and American contexts as well as in Africa, Asia, and the Middle East.

SOC 598  Independent Study  1 to 6 Credit Hours
Analytical assignments in sociology.
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Spanish (SPAN)

SPAN 521 Advanced Translation 3 Credit Hours
The course will continue to apply the translation theory and techniques introduced in Spanish 420, and it will continue to focus on English-to-Spanish and Spanish-to-English non-literary translation. Emphasis will be placed on materials selected from the fields of business, advertising, and legal discourse. Class projects will include translation of advertisements, legal documents, and business brochures. (AY,W).

Prerequisite(s): SPAN 303 and SPAN 420

Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Level is Undergraduate

Speech (SPEE)

SPEE 530 Small Group Communications 3 Credit Hours
A survey of small group behavior from the perspectives of theory, research, and practice. Activities and discussion will emphasize skills in leadership, problem solving, policy making, and the development of consensus. (F,W,S)

Prerequisite(s): SPEE 101

Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Statistics (STAT)

STAT 530 Applied Regression Analysis 3 Credit Hours
Topics include single variable linear regression, multiple linear regression and polynomial regression. Model checking techniques based on analysis of residuals will be emphasized. Remedies to model inadequacies such as transformation will be covered. Basic time series analysis and forecasting using moving averages and autoregressive models with prediction errors are covered. Additional assignments in logistic regression and forecasting will distinguish this course from its undergraduate version, STAT 430. Statistical packages will be used. Students cannot receive credit for both STAT 430 and STAT 530.

Prerequisite(s): STAT 425 or STAT 325 or IMSE 317

Restriction(s):
Can enroll if Level is Rackham or Graduate

STAT 535 Data Analysis and Modeling 3 Credit Hours
Linear models including models with factors associated with both fixed and random effects together with covariates. Models containing more complex covariance structure including repeated measures and time dependence. The statistical processing package SAS will be used extensively to analyze data associated with such models. The SAS procedures Proc GLM, Proc REG, and Proc Mixed will be used extensively in examples, assignments, and projects. (OC).

Restriction(s):
Can enroll if Class is Graduate

STAT 545 Reliability & Survival Analys 3 Credit Hours
Parametric and nonparametric modeling of reliability data from industrial experiments and survival data from biological experiments where the data may be censored. This includes models where covariates are present and where the data may be from the Weibull, log-normal, or the gamma distribution and also the nonparametric proportional hazards model and Cox regression. The statistical processing package SAS will be used extensively to analyze data associated with such models. The SAS procedure Proc LIFEREG will be used to analyze parametric regression models and the procedure Proc LIFETEST will be used to analyze nonparametric regression models in examples, assignments, and projects. (OC).

Restriction(s):
Can enroll if Class is Graduate

STAT 550 Multivariate Stat Analysis 3 Credit Hours
An introduction to commonly encountered statistical and multivariate techniques, while assuming only a limited knowledge of higher-level mathematics. Topics include: multivariate analysis of variance, multivariate regression, principal components and factor analysis, canonical correlation, and discriminant analysis.

Prerequisite(s): STAT 530

STAT 555 Environmental Statistics 3 Credit Hours
A wide variety of statistical tests important in environmental sciences will be covered through the use of case studies. Theory and applications of datasets, data displays, and formal statistical inference will be discussed. Students will obtain direct experience with the study and analysis of data, do projects, and write reports. (W, AY)

Restriction(s):
Can enroll if Class is Graduate

STAT 560 Time Series Analysis 3 Credit Hours
An introduction to time series, including trend effects and seasonality, while assuming only a limited knowledge of higher-level mathematics. Topics include: linear Gaussian processes, stationarity, autocovariance and autocorrelation; autoregressive (AR), moving average (MA) and mixed (ARMA) models for stationary processes; likelihood in a simple case such as AR(1); ARIMA processes, differencing, seasonal ARIMA as models for non-stationary processes; the role of sample autocorrelation, partial autocorrelation and correlograms in model choice; inference for model parameters; forecasting: dynamic linear models and the Kalman filter.

Prerequisite(s): STAT 530

STAT 590 Topics in Applied Statistics 3 Credit Hours
A course designed to offer selected topics in applied statistics. The specific topic will be announced together with the prerequisites when offered. Course may be repeated for credit when specific topic differs. (OC)

Restriction(s):
Can enroll if Level is Rackham or Graduate
STAT 597  Ind Studies in Statistics  1 to 3 Credit Hours
Independent Study in statistics for topics at the graduate level. Topics and objectives chosen by agreement between students and instructor.

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Tax (TAX)

TAX 501  Tax Acct Rules & Timing Iss  3 Credit Hours
Course examines in detail the cash and accrual accounting rules for income tax purposes, including inventory accounting, and the uniform capitalization rules. Time value of money principles and imputed interest matters are examined in connection with the original issue discount rules.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

TAX 502  Inc Taxation of Prop Trans I  3 Credit Hours
This course will survey several fundamental areas relating to the income taxation of property transactions. Topics will include noncash receipts and payments, introduction to basis, realization and recognition concepts, transactional losses including bad debt expense, limitations on transactional loss deductions cost recovery procedures, the general effect of debt on basis and amount realized calculations, and characterization issues. The planning and business aspects of these topics are emphasized.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

TAX 510  Fundamentals of Corporate Tax  3 Credit Hours
This course analyzes federal income tax rules relating to the definition, formation, operation, and liquidation of corporations including property distributions, stock redemptions, and tax/book income reconciliations. The planning and business aspects of these corporate items are emphasized. Students may not receive credit for both ACC 633 and TAX 510.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

TAX 511  Adv Corp Inc Tax  3 Credit Hours
This course analyzes federal income tax rules relating to corporations, including taxable acquisitions; tax free acquisitive, divisive, and bankruptcy reorganizations; corporate recapitalizations; and transfers of corporate attributes, including limitations on such transfers. The planning and business aspects of these corporate items are emphasized.
Prerequisite(s): ACC 633 or TAX 510
Restriction(s):
Can enroll if Class is Graduate

TAX 515  Flow Through Entities  3 Credit Hours
A study of advanced income tax problems involving partnerships and S-Corporations, including organization, operation, distributions, liquidations, basis, family partnerships, and sales and exchanges. The planning and business aspects of partnerships and S-Corporations are emphasized.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

TAX 522  Estate and Gift Taxation  3 Credit Hours
This course covers the basics of estate, trust taxation and tax issues encountered by small businesses. Topics include tax planning techniques to minimize the tax burden on intergenerational transfers of wealth, tax planning for the closely held business, capital formation and preservation, tax compliance and tax alternatives.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

TAX 527  International Income Taxation  3 Credit Hours
Course examines in a survey fashion the taxation of business and investment transactions by foreigners in the U.S. (in-bound transactions) and business and investment transactions by U.S. individuals and corporations in foreign countries (out-bound transactions). Topics include residence, source of income and deductions, taxation of foreign persons on U.S. source passive investment income and U.S. source business income, including income from U.S. branches of foreign corporations, and the effect U.S. tax treaties have on these matters. The course also includes a survey analysis of the foreign tax credit, the anti-tax deferral rules of Subpart F, and the intercompany transfer pricing rules. The planning and business aspects of these international transactions are emphasized.
Prerequisite(s): TAX 510
Restriction(s):

TAX 530  State and Local Taxation  3 Credit Hours
This course studies the basics of state and local taxation and their relationship to the federal tax structure. Topics include state/local income, property and sales taxation structures.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate

TAX 580  Special Topics in Taxation  1 to 6 Credit Hours
This course provides Master of Science in accounting students an opportunity for study of advanced and/or emerging issues in taxation. Selected topics in the course may include: Consolidated Tax Returns, Transfer Pricing, Accounting for Income Taxes, Deferred Compensation, Income Taxation of Trusts and Estates, Exempt Organizations, and Tax Procedure and Compliance.
Prerequisite(s): ACC 360
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Women's and Gender Studies (WGST)

WGST 501 Images of Women in Germany  3 Credit Hours
This course will focus on the position of women in Germany after WWII and up to and after the unification of East and West Germany. Particular attention will be given to the gendered history of working through the National Socialist past, the division and reconstruction of the two nation-states, and the terrorism in West Germany in the 1970’s. Students will examine images of women in films and tie them to the ideologies of gender and status of women in these larger issues of German history. Course readings will be in English. This course will be distinguished from its undergraduate counterpart, WGST 401, by the inclusion of additional readings and assignments.

WGST 504 Dissed: Differ, Power, Discrim  3 Credit Hours
Have you ever been dissed? Why are some people targets of disrespect? This course examines the unequal distribution of power-social, economic and political in the United States and other countries that results in favor for privileged groups. We will examine a variety of institutional practices and individual beliefs that contribute to disrespect. We’ll look at ways that beliefs and practices, like viewing inequality as consequence of a “natural order,” obscure the processes that create and sustain social discrimination. We will engage in the intellectual examination of systems, behaviors and ideologies that maintain discrimination and the unequal distribution of power and resources. Student will not receive credit for both WGST 404 and WGST 504. This course is distinguished from its 400-level counterpart by the requirement of additional assignments, including a required additional paper.

Restriction(s):
Can enroll if Class is Graduate

WGST 505 Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both SOC 443 and SOC 543. (YR).

Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

WGST 506 Culture and Sexuality  3 Credit Hours
The study of women, men, children, socialization practices and the genesis of sex roles cross-culturally. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both WGST 406 and WGST 506.

Prerequisite(s): ANTH 101
Restriction(s):
Can enroll if Class is Graduate

WGST 508 Gender, Pwr & Intl Development  3 Credit Hours
This course provides an overview of gender issues in development in the global South, including the differential effects of development policies on women and men, and the role of social movements in transforming development policy frameworks. Students may not receive credit for both WGST 408 and 508. Additional assignments will distinguish this course from its undergraduate counterpart (WGST 408).

Restriction(s):
Can enroll if Class is Graduate

WGST 509 Feminist Theories  3 Credit Hours
This course examines the different perspectives that feminist theorists have offered to analyze the unequal conditions of women’s and men’s lives. Students taking this course will develop an understanding of how theory functions as a way to know, understand and change the world. They will also be provided with a lens for comparing the assumptions and implications of alternative theoretical perspectives. A particular emphasis of this course is on theorizing the interrelationships among gender, race, class, sexuality and nationality. Course material includes applications of feminist theory to issues such as gender identity formation; sexuality; gender, law and citizenship; women and work; and the history and politics of social movements. Students will not receive credit for both WGST 409 and WGST 509. Additional reading assignments or projects will distinguish this course from its undergraduate version.

Prerequisite(s): LIBS 560

WGST 516 Ptgts & Prints Early Mod Japan  3 Credit Hours
Painting and woodblock prints of the Edo/Tokugawa (1600-1868) and Meiji II (1868-1912) periods are considered in light of competing developments that on the one hand looked to Japan’s classical tradition and on the other to the influence of arts and artists from China and the West. Special attention is given to female artists and images of women.

Prerequisite(s): ARTH 101 or ARTH 102 or ARTH 103 or ARTH 106 or ARTH 241

Restriction(s):
Can enroll if Class is Graduate
WGST 520  Kinship and Marriage  3 Credit Hours
A study of the diversity of kinship and marriage systems, and of the
diversity of kinship theory which has played a seminal role in
the development of general anthropological history. Additional
reading assignments or projects will distinguish this course from its
undergraduate version WGST 420. Students cannot receive credit for both
WGST 420 and WGST 520.
Prerequisite(s): ANTH 101 or ANTH 201
Restriction(s):
Cannot enroll if Class is Graduate

WGST 525  Women in Classical Antiquity  3 Credit Hours
This course examines the evidence for the lives of women in Greek,
Etruscan and Roman Antiquity, from the Bronze Age through the
Imperial Period. Special emphasis will be placed on the archaeological
evidence, especially works of art which illustrate women’s lives and their
relationships with men. Documents such as dedictary and funerary
inscriptions, the poetry of Sappho and Sulpicia, and selections from the
writings of Homer, Hesiod, Aristotle, Pliny, Juvenal, and other ancient
authors, will also be examined critically, particularly in relationship to the
works of art.
Prerequisite(s): ARTH 101

WGST 533  Writing Women in Renaissance  3 Credit Hours
This course will be taught in English, and will focus on the influence of
Italian literary models for the construction of female literary types as well as
female voices in France and Italy from 1300 to about 1600. Italian
authors studied include three very influential Florentines, Dante, Petrarch
and Boccaccio, as well as Castiglione and Ariosto. We will read women
poets, patrons, prostitutes and queens from Italy and France such as
Veronica Gambara, Isabella di Morra, Vittoria Colonna, Christine de Pizan,
Louise Labe and Marguerite de Navarre. At issue will be women’s roles
and women’s images in city and court culture during the early modern
period and the interaction of their writings with the literary canons of Italy
and France.
Restriction(s):
Can enroll if Class is Graduate

WGST 545  20C/21C Women Authors  3 Credit Hours
An analysis of images and problems of women as defined by significant
British and American women writers of the 20th and 21st centuries. Style
and narrative techniques will also be closely examined. Students cannot
receive credit for both WGST 445 and WGST 545.
Prerequisite(s): (COMP 106 or Composition Placement Score with a
score of 40 or COMP 220 or COMP 280 or COMP 270) and (ENGL 230
or ENGL 231 or ENGL 233 or ENGL 235 or ENGL 236 or ENGL 237 or
ENGL 239 or ENGL 200)
Restriction(s):
Can enroll if Class is Graduate

WGST 546  Marriage and Family Problems  3 Credit Hours
Sociological analysis of problems encountered within the institution of
marriage with particular reference to such issues as choosing a marriage
partner, sexual adjustment, occupational involvement, conflict resolution,
child rearing, divorce and readjustment. Students cannot receive credit for both WGST 446 and WGST 546. Additional reading assignments or projects will distinguish this course from its undergraduate version.
Prerequisite(s): SOC 200 or SOC 201 or WGST 275 or WST 275 or PSYC 275 or SOC 275 or ANTH 275 or HUM 275 or WGST 303 or PSYC 303 or SOC 303 or ANTH 303 or HUM 303

WGST 547  Family Violence  3 Credit Hours
Sociological analyses of various forms of family violence which occur
disproportionately in the lives of girls and women. Topics such as
incest, sexual abuse, date rape, wife battering and elder abuse will be
situated within the social and cultural context of contemporary gender
relationships. Social and political responses to the phenomena will be
examined. Additional reading assignments or projects will distinguish
this course from its undergraduate version WGST 447. Students cannot
receive credit for both WGST 447 and WGST 547.
Prerequisite(s): SOC 200 or SOC 201 or SOC 301 or SOC 443 or PSYC 405
Restriction(s):
Can enroll if Class is Graduate

WGST 550  Feminism & Mod. Mid. East  3 Credit Hours
This course provides an analysis of the history, historiography, and
sources for the study of feminism in the Middle East since 1800.
Additional assignments will distinguish the graduate version of this
course from the undergraduate version.
Restriction(s):
Can enroll if Class is Graduate

WGST 555  Gender and Media Studies  3 Credit Hours
The course will focus on several feminist approaches used in
understanding the media and attempting to create social change through
the media. The role of media in the definition and reproduction of gender-
based hierarchies and in the renegotiation of gender boundaries will
both be explored. To this end, both mainstream and women's media
will be examined. The course will take a multicultural and international
perspective, incorporating concerns of class, race, ethnicity and nation
as these intersect with the study of gender and media. Mainstream
and alternative media will be analyzed through readings, films, case
studies, in-class collaborative exercises and longer term projects. News,
entertainment and advertising genres will be examined in a variety of
media such as the printed press, television, video film and the Internet.
Prerequisite(s): WGST 275 or WGST 303
Restriction(s):
Can enroll if Class is Graduate

WGST 5555  Immigrant Cultures and Gender  3 Credit Hours
The history and culture of immigration since 1850, including: (1)
formation and perseverance of immigrant communities and interethnic
boundaries; (2) relations between the homeland and the immigrant;
and (3) impact of migration on family life and gender roles. Prerequisite
and junior or senior standing. Students may not receive credit for both
WGST 4555 and WGST 5555. For graduate credit take WGST 5555. This
course is distinguished from its 400-level counterpart by the requirement
of additional assignments.
Prerequisite(s): LIBS 560
Restriction(s):
Cannot enroll if Class is Graduate

WGST 5650  Sem in US Women's History  3 Credit Hours
Seminar on the historiography and key primary sources related to U.S.
Women's History. The course covers examples of classic texts in the field
as well as significant new works of scholarship, with an emphasis on
critical reading, analysis, and historiography of the field. Student gains
a deeper understanding of the field, its guiding concepts, foundational
texts, newest trajectories, and impact on the field of history as a whole.
The graduate version of this course includes weightier readings and
assignments.
Restriction(s):
Can enroll if Class is Graduate
WGST 571 LGBTQ Literature 3 Credit Hours
This course surveys primarily contemporary literature by writers who identify as gay, lesbian, bi-sexual, transgender, or queer. By studying the self-representation and culturally unique perspective of this emerging canon of writers, students in this course understand the emergence of LGBTQ literary traditions and understand the cultural diversity within these traditions. Students learn to identify the aesthetic qualities (such as camp, performativity, coded subtexts, homoeroticism, and the relationship between creativity and sexuality), and historical, political, and social concerns that characterize LGBTQ literary and cultural production. Topics covered include the struggle for civil rights before and after Stonewall, coming out narratives, the negotiation of homophobic cultures, post-colonial writers, and memoirs of the LGBTQ experience, as well as the historical emergence of sexual categories and the literary critique of heteronormativity. This course counts toward the English discipline diversity requirement.
Restriction(s):
Can enroll if Class is Graduate

WGST 573 Arab American Women Writers 3 Credit Hours
Examines the literary and cultural contributions of Arab and Arab American women novelists, poets, and artists to the development and consolidation of the cultures of understanding and coexistence; explores the tensions between citizenship and belonging, race and the politics of fear, gender and geographical mobility, and ethnic minorities and mainstream consciousness; discerns how Arab women writers and artists retool their various artistic endeavors to channel socio-political disenchantment, critique and civil disobedience; stresses how literary and artistic productions of heterogeneous number of Arab American women writers and artists can indeed foster alternative visions of socio-cultural coexistence, dialogue, and hospitality via artistic commitments to technical and stylistic experimentation and renovation. Additional reading assignments or projects will distinguish this course from its undergraduate version WGST 473. Students cannot receive credit for both WGST 473 and WGST 573.

WGST 581 Gender and Globalization 3 Credit Hours
Mass media, politics and academia are full of references to globalization, and a future "world without borders." This interdisciplinary course considers the implications of globalization for women’s lives, gender relations and feminism. Topics covered include the global factory, cross-cultural consumption, human rights, global communications, economic restructuring, nationalism and environmental challenges. Rather than survey international women’s movements, this course explores how globalization reframes identities and locations and the political possibilities they create. Students cannot receive credit for both WGST 481 and WGST 581.
Restriction(s):
Can enroll if Class is Graduate

WGST 590 Topics in Women’s Studies 3 Credit Hours
Examination of problems and issues related to Women and Gender Studies. Title as listed in Schedule of Classes will change according to specific content.
Prerequisite(s): WGST 275 or WST 275 or LIBS 580 or WGST 303
Restriction(s):
Can enroll if Class is Graduate

WGST 599 Independent Studies 1 to 3 Credit Hours
Provides opportunity for qualified Women and Gender Studies students to pursue independent research under the direction of a qualified faculty member. Project must be defined in advance, in writing and must be in a subject not currently offered in the regular curriculum.
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.

General Information
The University Of Michigan-Dearborn
The University of Michigan-Dearborn (UM-Dearborn) is one of the three campuses of the University of Michigan operating under the policies of the Board of Regents.

The campus, located on the former estate of automotive pioneer Henry Ford, was founded in 1959 as a senior-level institution offering junior, senior, and graduate-level courses and degrees. In 1971, UM-Dearborn became a comprehensive university campus offering four-year degree programs in liberal arts and sciences and graduate programs at the master’s degree level.

More than 9,100 students representing a wide range of academic interests and diverse backgrounds are currently enrolled at UM-Dearborn.

As part of the University of Michigan, UM-Dearborn enjoys the association with a large multi-university and the advantages of moderate size. Through expanded evening course offerings, professional development programs and cooperative education programs, UM-Dearborn continues to respond to the educational needs of commuting students from the Detroit metropolitan community.

Graduate Admissions
Office of Graduate Studies
4901 Evergreen Road
1055 Administration Building
Dearborn, MI 48128
313-583-6321
umd-graduastudies@umich.edu
umdearborn.edu/admissions/graduate (http://www.umdearborn.edu/admissions/graduate/)

General Admission Requirements
All graduate applicants are required to meet the following minimum requirements for admission:

- Completion of a bachelor’s degree from an approved institution.
  Criteria vary based on whether you earned your bachelor's degree from a US institution (https://umdearborn.edu/admissions/graduate/how-apply/basic-admission-requirements/us-regional-accreditation/) or an institution outside of the United States (https://
umdearborn.edu/admissions/graduate/how-apply/basic-admission-requirements/international-undergraduate-degree-requirements/.

- Applicants whose native language is not English must demonstrate English proficiency.

**Additional Requirements**

Additional requirements vary by program. A summary of basic requirements can be found sorted by college in our Prerequisites by College (p. 811) section of this catalog.

Applicants are considered for admission without regard to race, color, national origin, age, marital status, sex, sexual orientation, gender identity, gender expression, disability, religion, height, weight, or veteran status.

A holistic review of each applicant is conducted. Admission is granted to applicants who have been recommended for admission by the program to which they have applied. Preference is generally given to students who have at least a B average (3.0 in a 4.0 grading system) in relevant undergraduate coursework or otherwise provide evidence of promise that is satisfactory to the admitting program.

Admitted international students seeking an F-1 or J-1 visa must submit an Affidavit of Financial Support along with an original bank certification (in English) from their financial supporter or a detailed letter of sponsorship from a government, employer, or other organization indicating the exact dollar amount available for expenses in U.S. funds. The bank statement must show the required available funds as specified on the affidavit. The Affidavit of Financial Support is valid for one year. See more at umdearborn.edu/offices/international-affairs/admitted-international-students (https://umdearborn.edu/offices/international-affairs/admitted-international-students/).

**Applying for Graduate Admission**

Find current information at: umdearborn.edu/grad_applynow/ (http://www.umdearborn.edu/grad_applynow/)

We serve highly motivated candidates whose accomplishments suggest the ability to successfully complete a rigorous program of graduate study. Applicants are evaluated not only for academic ability, but for career goals and overall “fit” for their selected program of study. Applicants should carefully review the available programs and choose one that is most appropriate for their future goals. Application deadlines (umdearborn.edu/grad_appdeadlines/ (http://www.umdearborn.edu/grad_appdeadlines/)) vary by program. **Note:** Not all programs admit for every term.

A generalized list of steps for how to apply is provided below. Complete details can be found at: umdearborn.edu/grad_applynow/ (http://www.umdearborn.edu/grad_applynow/)

- Submit an online application.
- Complete a statement of purpose.
- Gather required letter(s) of recommendation.
  - College of Arts, Sciences, and Letters (CASL): 3
  - College of Business (COB): 1
  - College of Education, Health, and Human Services (CEHHS): 3
  - College of Engineering and Computer Science (CECS): 2 for master’s level; 3 for doctoral level
- Provide current copy of CV/resume.
- Request official college/university transcripts from all institutions attended.
- Request any relevant test scores (GRE or GMAT) be sent. Not all programs require a standardized test.
- Submit required language proficiency scores (TOEFL, IELTS, or MELAB) if a non-native English speaker. Please refer to the policies below.

**English Language Requirements for Graduate Admission**

Applicants whose native language is not English must demonstrate English proficiency and are required to provide an official score report of an accepted English Language Proficiency Test. Proficiency tests that are accepted are the International English Language Testing System (IELTS), the Michigan English Language Assessment Battery (MELAB) and the Test of English as a Foreign Language (TOEFL). Our TOEFL institution code is 1861. Applicants only need to take one of these test options. Achieving the minimum score does not guarantee admission, only consideration. The table below provides the minimum score required by test type.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Minimum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>IELTS</td>
<td>Overall 6.5</td>
</tr>
<tr>
<td>MELAB</td>
<td>Overall 80</td>
</tr>
<tr>
<td>IBT TOEFL Internet Based Test</td>
<td>Overall 84</td>
</tr>
<tr>
<td>CBT TOEFL ComputerBased Test</td>
<td>Overall 220</td>
</tr>
<tr>
<td>TOEFL Written Test</td>
<td>Overall 560</td>
</tr>
</tbody>
</table>

**English Proficiency Exemptions**

- Applicants who have earned or will earn a bachelor’s or master’s degree from an institution where the language of instruction is exclusively English may be exempt from submitting an Official English Proficiency Score. Verification from the school may be required.

The following graduate degree programs will not grant this exemption and require submission of an accepted English Language Proficiency Test:

- Automotive Systems and Mobility (DEng)
- Automotive Systems Engineering (MSE)
- Bioengineering (MSE)
- Computer and Information Science (PhD)
- Electrical, Electronics and Computer Engineering (PhD)
- Energy Systems Engineering (MSE)
- Industrial and Systems Engineering (PhD)
- Manufacturing Systems Engineering (MSE)
- Mechanical Sciences and Engineering (PhD)
- Mechanical Engineering (MSE)
- Applicants who have earned or will earn a bachelor’s or master’s degree from a country where the official language is English (United States of America, Australia, or England) are exempt from submitting an Official English Proficiency Score.

For testing information, please visit:

**IELTS**

100 East Corson Street, Suite 200
Pasadena, CA 91103, U.S.A.
Telephone: 626-564-2954
www.ielts.org (http://www.ielts.org)
Student Expectations

The primary purpose of the Statement of Student Rights and Code of Student Conduct (https://umdearborn.edu/students/registration-records/policies/student-rights-code-conduct/) is to assist the University in providing an environment which supports the educational process and the well-being of the campus community. The responsibility for maintaining such an environment is shared by all members of the campus community including faculty, staff, current and prospective students. Therefore, any person expressing interest in enrolling at the University of Michigan-Dearborn is expected to demonstrate behavior consistent with the Code of Conduct. Behaviors inconsistent with the Code of Student Conduct will not be tolerated. The University seeks applicants that demonstrate the potential to be contributing members of the campus community and reserves the right to deny admission based upon violation(s) of the Code of Student Conduct.

Prerequisites by College

Program prerequisites (undergraduate degree or major required, any academic standardized test scores, prerequisite courses, work experience or other credential that might be required) can be found for each college's programs through the following links:

- College of Arts, Sciences, and Letters (CASL) (p. 811)
- College of Business (COB) (p. 812)
- College of Education, Health, and Human Services (CEHHS) (p. 814)
- College of Engineering and Computer Science (CECS) (p. 815)

College of Arts, Sciences, and Letters

Applied and Computational Mathematics (MS)

Undergraduate Degree Required
Bachelor's degree in mathematics, a physical or life science, or engineering with an expected 3.0 minimum cumulative GPA or higher

Standardized Test Scores
GRE not required

Prerequisite Courses

- 3 courses in calculus, including multivariate calculus*
- Introductory course in linear algebra*
- Introductory course in differential equations*

*Prerequisite courses may be taken concurrently

Accelerated 4+1 Option - Effective Fall 2020

Current UM-Dearborn students may be eligible for the 4+1 option (https://umdearborn.edu/casl/graduate-programs/programs/master-science-applied-and-computational-mathematics/applied-and-computational-mathematics-41-option/) if they have:

- declared a mathematics major with at least 60 completed credit hours
- a cumulative GPA of at least 3.2
- completed the following prerequisite courses:
  - CIS/CCM 150 (or CIS 1501 or CCM 172)
  - MATH 227 (grade of B+ or better)
  - MATH 228 (grade of B+ or better)
  - MATH 300

Criminology and Criminal Justice (MS)

Undergraduate Degree Required
Bachelor's degree with an expected minimum cumulative GPA of 3.0 or higher

Standardized Test Scores
GRE not required

Prerequisite Courses

- Introduction to Criminal Justice (CRJ 200 or equivalent)*
- Criminology (CRJ 468 or equivalent)*
- Criminal Law (CRJ 416 or equivalent)*

*Prerequisite courses should be completed prior to graduate coursework; these courses may be taken concurrently with graduate coursework at the discretion of the program director

Accelerated 4+1 Option

Current UM-Dearborn undergraduate Criminology and Criminal Justice students who have completed at least 60 credit hours with a cumulative GPA of 3.0 or better may be eligible to enroll in the 4+1 accelerated option (p. 821).

Environmental Science (MS)

Undergraduate Degree Required
Bachelor's degree in biology, chemistry, environmental science, or geology with an expected 3.1 minimum cumulative GPA or higher

Standardized Test Scores
GRE not required

Prerequisite Courses

- 1 field course in biology or geology*
- 1 course in biology*
- 1 course in geology*
- 1 course in physics*
• 1 course in statistics*
• 2 courses in calculus*
• 3 courses in chemistry*

*Prerequisite courses may be taken concurrently with graduate coursework.

Psychology (MS)
Undergraduate Degree Required
Bachelor’s degree in Psychology or a related major with an expected minimum cumulative GPA of 3.0 or higher. Students without undergraduate Psychology degrees are welcome to apply, but will need to have taken all prerequisites.

Standardized Test Scores
GRE (http://www.ets.org/gre/)
The admission review committee will consider a waiver request (https://umich.app.box.com/s/rhg3kg4j9s159j2psytelly90a0bwkzi/) on a case-by-case basis, though waivers are not generally granted.

Prerequisite Courses
• Introductory psychology
• Statistics
• Abnormal psychology

Public Administration and Policy (MPAP)
Undergraduate Degree Required
Bachelor’s degree with an expected minimum cumulative GPA of 3.0 or higher.

Standardized Test Scores
GRE not required

Other Experience Required
Public or non-profit management experience is required or an additive credit internship may need to be taken.

College of Business
Accounting (MS)
Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor’s degree from a regionally accredited institution.

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Prerequisite courses may be taken concurrently with graduate coursework.

Business Administration (MBA)
Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor’s degree from a regionally accredited institution.

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https://umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Note: Current UM-Dearborn undergraduate students may qualify for the Accounting 4+1 option (p. 821) resulting in both the BBA in Accounting and the MS in Accounting.

Business Analytics (MS)
Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor’s degree from a regionally accredited institution.

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https://umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Dual Degree - Accounting (MS)/Finance (MS)
Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor’s degree from a regionally accredited institution.

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)
Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Dual Degree - Business Administration
(MBA)/Health Services Administration
(MHSA)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor’s degree from a regionally accredited institution

Standardized Test Score
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Dual Degree - Business Administration
(MBA)/Industrial Systems Engineering
(MSE)

The College of Business and the College of Engineering and Computer Science offer an innovative dual degree program leading to the simultaneous award of a Master in Business Administration (MBA) and a Master of Science in Engineering -Industrial & Systems Engineering (MSE-ISE).

Undergraduate Degree Required
Bachelor’s degree in engineering, a physical science, computer science, or applied mathematics

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)

Prerequisite Courses
A course in probability and statistics (MSE 501 or equivalent)**

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

**If admission prerequisites are unfulfilled, the applicant must speak to an advisor (https://umdearborn.edu/academics/graduate-studies/office-graduate-studies/graduate-program-specific-contacts/) for the Industrial & Systems Engineering program.

Dual Degree - Business Administration
(MBA)/Information Systems Administration
(MSE)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor’s degree from a regionally accredited institution

Standardized Test Score
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.
Dual Degree - Business Administration (MBA)/Supply Chain Management (MS)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor's degree from a regionally accredited institution

Standardized Test Score
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725.1464036529725.1464036529725.1&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)_
(http://www.ets.org/gre/)*

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Finance (MS)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor's degree from a regionally accredited institution

Standardized Test Score
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725.1464036529725.1464036529725.1&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)_
(http://www.ets.org/gre/)*

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Information Systems (MS)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor's degree from a regionally accredited institution

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725.1464036529725.1464036529725.1&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)_
(http://www.ets.org/gre/)*

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Marketing (MS)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor's degree from a regionally accredited institution

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725.1464036529725.1464036529725.1&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)_
(http://www.ets.org/gre/)*

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

Supply Chain Management (MS)

Undergraduate Degree Required
Equivalent of a four-year U.S. bachelor's degree from a regionally accredited institution

Standardized Test Scores
GMAT (http://www.mba.com/us/the-gmat-exam/register.aspx?__hstc=202220878.786ca484f45d06c02d65869df70e46d5.1464036529725.1464036529725.1464036529725.1&__hssc=202220878.1.1464036529725.1464036529725.1464036529725.1&__hsfp=3202357837&_ga=1.131093967.1791843713.1464036528)_
(http://www.ets.org/gre/)*

Prerequisite Courses
A grade of C or better in an undergraduate course in college algebra, trigonometry, pre-calculus, or higher.

*Eligibility criteria (https://umdearborn.edu/cob/graduate-programs/admission/?utm_source=umdearborn.edu&utm_medium=http301&utm_campaign=redirect&utm_content=https%3A//umdearborn.edu/cob/mscriteria) is available on the College of Business website for a GMAT/GRE waiver. Qualifying applicants should select "Yes" when asked if you qualify for a GMAT/GRE waiver within the Test Score section of the online application.

College of Education, Health, and Human Services

Applied Behavior Analysis (MS)

Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Community Based Education (MA)

Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Other Requirements
Students will be invited to participate in a group interview after their initial application materials have been received

**Early Childhood Education (MA)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Other Experience Required
Teaching certificate required for the Early Childhood Specialist concentration

**Education (EdD)**
Previous Degree Required
Master's degree with a 3.3 GPA or higher

Standardized Test Scores
GRE (http://www.ets.org/gre/) required

Other Experience Required
At least 3 years teaching experience or the equivalent experience working in a professional setting

**Education (MA)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Other Experience Required
Teaching certificate required if seeking concentration tied to additional endorsement

**Education Specialist (EdS)**
Previous Degree Required
Master's degree with a 3.3 GPA or higher

Standardized Test Scores
GRE not required

Other Experience Required
At least 3 years teaching experience or the equivalent experience working in a professional setting

**Educational Leadership (MA)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Other Experience Required
Valid elementary or secondary teaching certificate

**Educational Technology (MA)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

**Health Information Technology (MS)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Other Experience Required
1 course in microeconomics*
1 course in macroeconomics*

*Courses may be taken concurrently, but prerequisites must be fulfilled during first year of study

**Program Evaluation and Assessment (MA)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

**Teaching (MA)**
Undergraduate Degree Required
Bachelor's degree with a 3.0 GPA or higher

Standardized Test Scores
GRE not required

Other Experience Required
Benchmarked scores in Evidence-Based Reading and Writing and Math on the Scholastic Aptitude Test (SAT)

This is a new policy as of October 1, 2017. For further information, please review the Michigan Department of Education’s SAT Implementation Guide (https://umich.app.box.com/v/sat-implementation-guide/).

**College of Engineering and Computer Science**

**Automotive Systems Engineering (MSE)**
Undergraduate Degree Required
Bachelor's degree in engineering from an ABET-accredited program with a minimum cumulative GPA of 3.0 (on a 4.0 scale)

Standardized Test Scores
GRE not required

**Automotive Systems and Mobility (DEng)**
Previous Degrees Required
• Bachelor’s degree in engineering or computer science from an accredited program with an expected GPA of 3.0 or higher on a 4-point scale
• Master’s degree in engineering or computer science from an accredited program with an expected GPA of 3.2 or higher on a 4-point scale

**Standardized Test Scores**
GRE (http://www.ets.org/gre/) required

**Other Experience Required**
At least 2 years of full-time equivalent engineering experience

Please note: Preference will be given to applicants who meet one of the following criteria:
• Scholarships provided by companies or government organizations
• Employer commitment in writing (ex. reduced working hours to 30 hours/week for three years)

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**Bioengineering (MSE)**

**Undergraduate Degree Required**
Bachelor of Science (BS) in bioengineering or a related engineering or science discipline from an ABET-accredited program (http://main.abet.org/aps/AccreditedProgramSearch.aspx) with a grade point average of B (3.0) or better *

Students from non-bioengineering fields may be required to take preparatory courses before or after starting the program. If admission prerequisites are unfulfilled, the applicant must speak to an advisor (https://umdearborn.edu/academics/graduate-studies/office-graduate-studies/graduate-program-specific-contacts/).

**Standardized Test Scores**
GRE not required

**Prerequisite Courses**
• Anatomy & physiology with lab
• One year of calculus-based physics (2 courses; PHYS 150 and PHYS 151)
• One year of chemistry (2 courses; CHEM 134 and CHEM 136)
• Mathematics through calculus III (MATH 205 or MATH 215) AND ordinary differential equations (MATH 216)
• Engineering core, including the following courses at minimum:
  • Solid mechanics and dynamics (ME 265)
  • Thermo-fluid sciences (BENG 325)

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**Computer and Information Science (MS)**

**Undergraduate Degree Required**
Bachelor’s degree from an accredited program with a minimum GPA of 3.0 or higher

**Standardized Test Scores**
GRE not required

**Prerequisite Courses**
• Probability and Statistics (IMSE 317 or STAT 326 or MATH 425 or equivalent) required
• Programming

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**Computer and Information Science (PhD)**

**Previous Degrees Required**
• Bachelor or master’s degree in engineering, applied mathematics, computer science, or a physical science
  • Bachelor’s degree expected GPA of 3.2 or higher on a 4-point scale
  • Master’s degree expected GPA of 3.5 or higher on a 4-point scale

**Standardized Test Scores**
GRE (http://www.ets.org/gre/) required

**Prerequisite Courses**
• 12 credit hours in Calculus
• Linear Algebra (MATH 217 or MATH 227 or equivalent)
• Data Structures (CIS 350 or equivalent)
• Computer Organization (CIS 310 or equivalent)
• Operating Systems (CIS 450 or equivalent)
• Calculus-based Probability and Statistics (IMSE 317 or equivalent)

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**Computer Engineering (MSE)**

**Undergraduate Degree Required**
Bachelor’s degree in Electrical and/or Computer Engineering with an overall GPA of 3.0 or higher

**Standardized Test Scores**
GRE not required

**Cybersecurity and Information Assurance (MS)**

**Undergraduate Degree Required**
Bachelor’s degree in a Science, Technology, Engineering, or Mathematics (STEM) field with an average of 3.0 on the 4.0 scale

**Standardized Test Scores**
GRE not required

**Prerequisite Courses**
• Probability and Statistics (IMSE 317 or STAT 326 or MATH 425 or equivalent) required
• Programming
Data Science (MS)

Undergraduate Degree Required
Bachelor's degree in a Science, Technology, Engineering, or Mathematics (STEM) field with an average of 3.0 on the 4.0 scale

Standardized Test Scores
GRE not required

Prerequisite Courses
- One course in programming (CIS 2001 OR CIS 200 or equivalent)
- Calculus II (MATH 116 or equivalent)
- Probability and Statistics (IMSE 317 OR STAT 326 OR MATH 425 or equivalent)
- Calculus III (MATH 215 or equivalent) Recommended
- Linear Algebra (MATH 227 or equivalent) Recommended

*Prerequisite courses may be taken concurrently within first 2 semesters in the program.

Electrical, Electronics and Computer Engineering (PhD)

Previous Degrees Required
- Bachelor or master's degree in electrical engineering or computer science with an expected GPA of 3.2 or higher on a 4-point scale

Backgrounds in other engineering fields, physical science or mathematical science may be considered with the understanding that additional coursework may be required

Standardized Test Scores
GRE (http://www.ets.org/gre/) Required

Prerequisite Courses
- Ordinary Differential Equations (MATH 216 or equivalent)
- Linear Algebra (Math 227 or equivalent)
- Probability and Statistics (IMSE 317 or equivalent)
- Data Structures and Algorithms (IMSE 351 or equivalent)
- Knowledge in computer programming

Electrical Engineering (MSE)

Undergraduate Degree Required
Bachelor's degree in Electrical and/or Computer Engineering with an overall GPA of 3.0 or higher

Standardized Test Scores
GRE not required

Energy Systems Engineering (MSE)

Undergraduate Degree Required
Bachelor of Science in engineering or equivalent

Standardized Test Scores
GRE not required

Engineering Management (MS)

Undergraduate Degree Required
Bachelor's degree in engineering OR a degree in math, computer science, or a physical science coupled with at least 5 years experience in engineering after completion of bachelor's degree

Standardized Test Scores
GRE not required

Prerequisite Courses
- Calculus-based course in probability and statistics

Human Centered Design and Engineering (MS)

Undergraduate Degree Required
Bachelor's degree in cognitive science, computer science, art, design, engineering, business, or related areas with an overall GPA of 3.0 or higher

Standardized Test Scores
GRE not required
Industrial and Systems Engineering (MSE)

Undergraduate Degree Required
Bachelor's degree in engineering, a physical science, computer science, or applied mathematics

Standardized Test Scores
GRE not required

Prerequisite Courses
- A course in probability and statistics (IMSE 510 or equivalent)*
- A course in operations research (IMSE 500 or equivalent)*

*If admission prerequisites are unfulfilled, the applicant must speak to an advisor (https://umdearborn.edu/academics/graduate-studies/office-graduate-studies/graduate-program-specific-contacts/).

Manufacturing Systems Engineering (MSE)

Undergraduate Degree Required
Bachelor of Science in engineering or a physical science from an accredited program with an average of B or better (3.0 GPA or higher)

Standardized Test Scores
GRE not required

Prerequisite Courses
- A background in probability and statistics*
- A background in engineering materials*

*If the applicant does not have a background in probability and statistics, they will be required to take a statistics course at the undergraduate level (IMSE 317 or equivalent). If the applicant does not have a background in engineering materials, they will be required to take ENGR 250 (or equivalent) as a prerequisite to AE 587 or ECE 385 (or equivalent) as a prerequisite to ECE 539.

Industrial and Systems Engineering (PhD)

Previous Degrees Required
- Bachelor's degree with an overall GPA of 3.2 or higher on a 4-point scale
- Master's degree in engineering, applied mathematics, computer science, or a physical science with an expected GPA of 3.5 or higher on a 4-point scale

Standardized Test Scores
GRE (http://www.ets.org/gre/) required

Prerequisite Courses
- Knowledge of computer programming
- 12 credit hours in Calculus
- Linear Algebra (MATH 217 or MATH 227 or equivalent)
- Operations Research (IMSE 500 or equivalent)
- Calculus-based Probability and Statistics (IMSE 510 or equivalent)

Mechanical Engineering (MSE)

Undergraduate Degree Required
Bachelor of Science in mechanical engineering or equivalent from an accredited school with a GPA of 3.0 or higher on a 4.0 scale

Standardized Test Scores
GRE not required

Program and Project Management (MS)

Undergraduate Degree Required
Bachelor's degree in engineering, business, economics, math, computer science, or other physical sciences with a bachelor's cumulative GPA of 3.0 or higher

Standardized Test Scores
GRE not required

Prerequisite Courses
Coursework in probability and statistics that can be satisfied by completing IMSE 510 as part of approved electives within the first two semesters of admission into the program

Other Experience Required
At least 2 years of practical work experience

Information Systems and Technology (MS)

Undergraduate Degree Required
Bachelor's degree in engineering, a physical science, computer science, applied mathematics, business administration, or liberal arts with a minimum cumulative GPA of 3.0 or higher

Standardized Test Scores
GRE not required

Prerequisite Courses
- A course in Data Structures (IMSE 350/351, CIS 350/352, or equivalent)
- Knowledge of computer programming, such as C++ or Java (IMSE 255, IMSE/CIS 150, CIS 205 or equivalent)

Mechanical Sciences and Engineering (PhD)

Previous Degrees Required
- Bachelor or master's degree in mechanical engineering or a closely related field with an expected GPA of 3.2 or higher on a 4-point scale

Backgrounds in other engineering fields or non-engineering fields may be considered with the understanding that additional coursework may be required

Standardized Test Scores
GRE (http://www.ets.org/gre/) required
Software Engineering (MS)

Undergraduate Degree Required
Bachelor’s degree in computer science and/or computer engineering with an overall GPA of 3.0 or higher

Standardized Test Scores
GRE not required

Prerequisite Courses
- Calculus I & II *
- CIS 310 (Computer Organization) *
- CIS 350 (Data Structures and Algorithm Analysis) *
- CIS 450 (Operating Systems) *
- IMSE 317 (Engineering Probability and Statistics) or linear algebra *

Other Experience Required
Proficiency in calculus, linear algebra, statistics, and physics.

*Prerequisite courses may be taken concurrently within 2 years of admission to program

Program and College Information

Graduate Programs Offered

UM-Dearborn offers six doctoral degree programs, one specialist program and over 40 master’s degree programs that are professional in their orientation. Many of our courses are offered in the evening (6:00 to 9:00 pm) and online, so graduate students can earn their degree while still meeting the demands of their professional and personal obligations.

Each graduate program of study provides opportunities to expand skillsets and knowledge, develop leadership qualities, and attain what is needed to advance professionally. Graduate programs embody the academic standards of The University of Michigan.

UM-Dearborn programs include:

| Accounting (MS) | Electrical Engineering (MSE) |
| Applied and Computational Mathematics (MS) | Energy Systems Engineering (MSE) |
| Applied Behavior Analysis (MS) | Engineering Management (MS) |
| Automotive Systems and Mobility (DEng) | Environmental Science (MS) |
| Automotive Systems Engineering (MSE) | Finance (MS) |
| Bioengineering (MSE) | Health Information Technology (MS) |
| Business Administration (MBA) | Human Centered Design and Engineering (MS) |
| Business Analytics (MS) | Industrial and Systems Engineering (MSE) |
| Community Based Education (MA) | Industrial and Systems Engineering (PhD) |
| Computer and Information Science (MS) | Information Systems (MS) |
| Computer and Information Science (PhD) | Information Systems and Technology (MS) |
| Computer Engineering (MSE) | Manufacturing Systems Engineering (MSE) |
| Criminology and Criminal Justice (MS) | Marketing (MS) |
| Cybersecurity and Information Assurance (MS) | Mechanical Engineering (MSE) |
| Data Science (MS) | Mechanical Sciences and Engineering (PhD) |
| Early Childhood Education (MA) | Program and Project Management (MS) |
| Education (MA) | Program Evaluation and Assessment (MA) |
| Education (EdD) | Psychology (MS) |
| Education Specialist (EdS) | Public Administration and Policy (MPAP) |
| Educational Leadership (MA) | Software Engineering (MS) |
| Educational Technology (MA) | Supply Chain Management (MS) |
| Electrical, Electronics, and Computer Engineering (PhD) | Teaching (MAT) |

The UM-Dearborn programs offered under the auspices of the Horace H. Rackham School of Graduate Studies (hereafter Rackham) include: Computer and Information Science (PhD), Electrical, Electronics, and Computer Engineering (PhD), Industrial and Systems Engineering (PhD), and Mechanical Sciences and Engineering (PhD).

Admission and student services for all graduate programs offered at UM-Dearborn are handled on our campus.

Office of Graduate Studies

The Office of Graduate Studies manages the graduate admissions process and collaborates with the four colleges to support graduate student success. Graduate Studies staff can be reached at 313-583-6321 and by email at umd-graduatestudies@umich.edu. More information can be found online at: umdearborn.umd.umich.edu/graduate-studies and umdearborn.edu/admissions/graduate

A comprehensive list of our graduate programs by college follows. Programs indicated with an asterisk symbol (*) are also offered online. Programs indicated with a double asterisk (**) are no longer accepting new applications.

College of Arts, Sciences, and Letters

umdearborn.edu/casl/graduate-programs (https://umdearborn.edu/casl/graduate-programs/)
caslgrad@umich.edu
313-593-1183

- Applied and Computational Mathematics (MS) (p. 847)
- Criminology and Criminal Justice (MS) (p. 848)
- Environmental Science (MS) (p. 852)
- Psychology (MS) (p. 855)
- Public Administration and Policy (MPAP) (http://catalog.umd.umich.edu/graduate/college-arts-sciences-letters/public-administration-policy/)
College of Business

umdearborn.edu/cob/graduate-programs/ (https://umdearborn.edu/cob/graduate-programs/)
umd-gradbusiness@umich.edu
313-593-5460

• Accounting (MS) (p. 879)
• Business Administration (MBA) (p. 884)*
• Business Analytics (MS) (p. 887)
• Finance (MS) (p. 909)*
• Information Systems (MS) (p. 912)
• Marketing (MS) (http://catalog.umd.umich.edu/graduate/college-business/marketing/)
• Supply Chain Management (MS) (p. 917)

College of Education, Health, and Human Services

umdearborn.edu/cehhs/graduate-programs/ (https://umdearborn.edu/cehhs/graduate-programs/)
umd-ed-grad@umich.edu
313-593-5090

• Applied Behavior Analysis (MS) (p. 922)
• Community Based Education (MA) (p. 923)
• Early Childhood Education (MA) (p. 924)
• Education (EdD) (p. 930)
• Education (MA) (p. 926)*
• Education Specialist (EdS) (p. 928)
• Educational Leadership (MA) (p. 933)
• Educational Technology (MA) (p. 934)*
• Health Information Technology (MS) (p. 936)
• Program Evaluation and Assessment (MA) (p. 937)
• Science Education (MS) (p. 938)**
• Special Education (MS) (p. 939)**
• Teaching (MAT) (p. 940)

Please note: The Education (MA) with Teaching English to Speakers of Other Languages (TESOL) and the Education (MA) without Additional Endorsement can both be completed online.

College of Engineering and Computer Science

umdearborn.edu/cecs/graduate-programs (https://umdearborn.edu/cecs/graduate-programs/)
umd-engingrad@umich.edu
313-593-0897

• Automotive Systems and Mobility (DEng) (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/automotive-systems-mobility/)
• Automotive Systems Engineering (MSE) (p. 950)*
• Bioengineering (MSE) (p. 951)
• Computer and Information Science (MS) (p. 954)*
• Computer and Information Science (PhD) (p. 956)
• Computer Engineering (MSE) (p. 965)*
• Cybersecurity and Information Assurance (MS) (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/cyber-security-information-assurance/#text)
• Data Science (MS) (p. 979)
• Electrical Engineering (MSE) (p. 981)*
• Electrical, Electronics, and Computer Engineering (PhD) (p. 993)
• Energy Systems Engineering (MSE) (p. 996)*
• Engineering Management (MS) (p. 997)*
• Human Centered Design and Engineering (MS) (p. 998)*
• Industrial and Systems Engineering (MSE) (p. 999)*
• Industrial and Systems Engineering (PhD) (p. 1001)
• Information Systems and Technology (MS) (p. 1010)*
• Manufacturing Systems Engineering (MSE) (p. 1014)*
• Mechanical Engineering (MSE) (p. 1021)*
• Mechanical Sciences and Engineering (PhD) (p. 1029)
• Program and Project Management (MS) (p. 1032)*
• Software Engineering (MS) (p. 1034)*

Dual Degree Programs

umdearborn.edu/cob/graduate-programs/ (http://www.umd.edu/cob/graduate-programs/)
umd-gradbusiness@umich.edu
313-593-5460

• Accounting (MSA) and Finance (MSF) (p. 898)
• Finance (MS)* and Business Administration (MBA) (p. 888)*
• Health Services Administration (MHSA) and Business Administration (MBA) (p. 907)
• Industrial and Systems Engineering (MSE)* and Business Administration (MBA) (p. 904)*
• Information Systems (MS) and Business Administration (MBA) (p. 892)
• Supply Chain Management (MS) and Business Administration (MBA) (p. 896)

Certificate Programs

College of Education, Health, and Human Services

umdearborn.edu/cehhs/professional-development-training/certificates/graduate-certificate-programs (https://umdearborn.edu/cehhs/professional-development-training/certificates/graduate-certificate-programs/)
umd-grad@umich.edu
313-593-5090

• Applied Behavior Analysis (BCBA) (p. 922)
• Online Teaching (p. 936)*
• STEM2: Teaching (p. 935)
• Teaching English to Speakers of Other Languages (TESOL) (p. 941)
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College of Engineering and Computer Science
umdearborn.edu/cecs/graduate-programs/certificates (https://umdearborn.edu/cecs/graduate-programs/certificates/)
umd-engingrad@umich.edu
313-593-4079

• Automotive Materials and Design Engineering (p. 946)*
• Automotive Noise, Vibration & Harshness (NVH) (p. 946)*
• Automotive Powertrains (p. 946)*
• Control Systems (p. 977)*
• Electric Energy Technology (p. 981)*
• Game Design (p. 998)*
• Intelligent Systems in Engineering Applications (p. 1013)*
• Plastic and Composite Materials (p. 1032)*
• Program and Project Management (p. 1033)*
• Software Engineering (p. 1036)*
• Systems Engineering (p. 1036)*
• Vehicle Electronics and Controls (p. 1037)*

Special Program Admission

Admission to one of the special programs listed below allows students to take courses at the graduate level without completing a degree seeking application. Special program selection is based on different sets of criteria and unique to each applicant. Please visit the Graduate Studies forms page (https://umdearborn.edu/academics/graduate-studies/office-graduate-studies/graduate-studies-forms/) online for applications.

• 4+1 Options
• Certificate Programs
• Change of Degree Level within a Field
• Change of Program
• Guest
• Michigan Intercollegiate Graduate Study
• Non-Candidate for Degree
• Readmission
• Retired Person Studies Program (p. 824)
• Second Master's Degree (p. 824)
• Visiting Scholar (p. 824)

4+1 Options

**Accounting 4+1 Option**

The Accounting 4+1 option at the University of Michigan-Dearborn allows students to earn both the BBA in Accounting and the Master of Science in Accounting at a substantial savings in time and money.

Students may count 4 graduate accounting courses toward the BBA Accounting major and the MS-Accounting at the same time, thereby saving 4 courses. Students will receive scholarships to reduce the net cost of these 4 shared courses to undergraduate tuition rates.

For more information, please visit the College of Business’s Accounting 4+1 Option webpage (https://umdearborn.edu/cob/graduate-programs/degree-programs/ms-accounting/accounting-41-option/).

**Applied Behavior Analysis 4+1 Option**

The Applied Behavior Analysis 4+1 option at the University of Michigan-Dearborn is designed to allow students who complete their undergraduate degree to fulfill the requirements of the MS in Applied Behavior Analysis with one additional year of graduate study.

This will be achieved by combining a portion of undergraduate and graduate coursework.

For more information, please visit the 4 + 1 Applied Behavior Analysis Accelerated Program webpage. (https://umdearborn.edu/casl/graduate-programs/areas-study/ms-applied-behavior-analysis/41-applied-behavior-analysis-accelerated-program/)

**Applied and Computational Mathematics 4+1 Option**

The Accelerated Masters Studies Option (4+1 Option) in Mathematics and Applied Computational Mathematics (MATH-ACM) is designed to allow motivated students to earn both a B.S. or A.B. in Mathematics (https://umdearborn.edu/casl/undergraduate-programs/areas-study/mathematics/) and an M.S. in Applied and Computational Mathematics (https://umdearborn.edu/casl/graduate-programs/programs/master-science-applied-and-computational-mathematics/) with one additional year of coursework. This is achieved via combining a portion of undergraduate and graduate coursework.

This program will be available for students to enroll in beginning Fall 2020.

For more information, please visit the Applied and Computational Mathematics 4 + 1 Option webpage. (https://umdearborn.edu/casl/graduate-programs/programs/master-science-applied-and-computational-mathematics/applied-and-computational-mathematics-41-option/)

**Bioengineering 4+1 Option**

The accelerated undergraduate/master's studies option in bioengineering (4+1 option) allows the most qualified UM-Dearborn undergraduate bioengineering students to pursue a program of study in which BSE and MSE degrees are earned in a five-year accelerated format.

This is achieved via combining a portion of undergraduate and graduate coursework.

For more information, please visit the 4 + 1 Bioengineering Program webpage. (https://umdearborn.edu/cecs/departments/mechanical-engineering/undergraduate-programs/41-bioengineering-program/)

**Criminology and Criminal Justice 4+1 Option**

The 4+1 accelerated program option allows current UM-Dearborn undergraduate Criminal Justice and Criminal Justice majors to complete both the Bachelor of Arts and the Master of Science in Criminalology and Criminal Justice in a format that offers substantial savings in both time and money. This is achieved by a double-counting allowance of up to 15 credits or 5 graduate level (500-level or above) courses. One additional year of graduate work (15 credits) would be needed to complete the Master’s program enabling students to earn two degrees in a total of five years.

Participation in the 4+1 program is limited to students who have completed at least 60 credit hours with a cumulative GPA of 3.0 or better.
Admission to the 4+1 program is at the discretion of the Program Director and requires an admission interview. The "regular" online graduate application should be completed with a "Yes" response to the 4+1 accelerated program question. The only supplemental materials required for 4+1 applicants are a letter of recommendation from a CCJ faculty member and official transcripts.

Once admitted to the 4+1 program, the student must attain a grade of B- or better in each 500 level class elected. Failure to do so may result in removal from the 4+1 program.

For more information, please visit the Criminology and Criminal Justice 4+1 Option webpage. (https://umdearborn.edu/cas/graduate-programs/programs/master-science-criminology-and-criminal-justice/41-option/)

**Educational Technology 4+1 Option**

The Master of Arts in Educational Technology Accelerated Program, or 4+1 program, is designed for undergraduate students in the Instructional Technology (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/instructional-technology/) major who have the interest, and demonstrated ability, to pursue the MA in Educational Technology. The program is designed to allow students who complete the BA in Instructional Technology (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/instructional-technology/) to fulfill the requirements of the MA in Educational Technology with one additional year of graduate study. This will be achieved by combining a portion of undergraduate and graduate coursework.

For more information, please visit the 4+1 Educational Technology Accelerated Program webpage. (https://umdearborn.edu/cehhs/graduate-programs/areas-study/ma-educational-technology-online/41-educational-technology-accelerated-program/)

**Certificate Programs**

A graduate certificate is a non-degree credential, less extensive than a Master’s program, which is designed to provide students with a specialized set of courses that supplement a primary field of study, area of expertise, or provide an interdisciplinary experience within a defined body of knowledge. Certificates are encouraged in areas not currently addressed by a graduate degree program and where they might provide added benefits to students beyond existing degree programs. More information, please visit the Graduate Certificate Policies webpage. (http://catalog.umd.umich.edu/academic-policies-graduate/grad-cert-policy/)

**College Education, Health, and Human Services**

For new students not enrolled in a UM-Dearborn degree program, please fill out the appropriate Certificate Program Application (accessed via the non-degree application online).

For more information regarding application to the CEHHS certificate programs, please visit the CEHHS Graduate Certificate Programs webpage (https://umdearborn.edu/cehhs/professional-development-training/certificates/graduate-certificate-programs/).

**College of Education and Computer Science**

**Degree Seeking Students**

Students already enrolled in a graduate degree program at UM-Dearborn may declare a CECS graduate certificate to supplement their primary field of study or area of expertise. Students must complete at least 6 credit hours in their graduate degree program before applying to a certificate program. In order to declare a certificate, students must fill out a Declaration of Certificate Form and return it to Extended Learning & Outreach located in room 2000 Professional Education Center (PEC).

**Non-Degree Seeking Students**

Students may also pursue a graduate certificate as a non-degree seeking student. Students pursuing this option should complete the appropriate Certificate Program application (accessed via the non-degree application online).

Because of the relatively few credit hours required to earn a certificate, credits earned at another accredited institution, including another University of Michigan campus cannot be transferred into the UM-Dearborn CECS certificate program.

For more information regarding application to the CECS certificate programs, please visit the CECS Graduate Certificate Programs webpage (https://umdearborn.edu/cecs/graduate-programs/certificates/).

**Change of Degree Level Within a Field**

To change from non-degree-seeking status (NCFD) to degree-seeking status within the same field of specialization, a student must submit a regular graduate admission application. An international student must supply documentation of additional funding if a change of degree status will result in an extension of the expected study period.

**Change of Program**

A change in program generally requires full consideration by the new program’s admissions committee. If a student has not enrolled yet, the change of program request can be handled through the Graduate Admissions Office. If a current student wants to change after having enrolled under a different program, a Graduate Change of Degree Program or Concentration form should be completed. The student should contact the new program of interest for information about any supporting materials that may be needed. International students must supply documentation of additional funding if a change of program will result in the issue of new immigration documents.

**Guest**

**Important Policies**

Students currently enrolled in a graduate degree-seeking program at another university may request permission to enroll in graduate courses at the University of Michigan-Dearborn as a guest student. Master’s level students are permitted to enroll for a maximum of 6 semester hours of credit and doctoral level students are permitted to enroll for a maximum of 9 semester hours of credit as a guest student at UM-Dearborn. Guest students register on a space-available basis.University of Michigan-Ann Arbor and University of Michigan-Flint students, while still considered guests, are not held to the above credit cap. However, these University of Michigan system students should follow relevant transfer credit policies.

Please note that the University of Michigan-Dearborn participates in the Michigan Intercollegiate Graduate Studies (MIGS) program (p. 823). Students in good standing at one institution may take advantage of course and research opportunities offered at another institution,
provided that such opportunities are not available on the home campus. If your current institution participates in MIGS and the courses you are interested in taking are not available at your home institution, you should consider applying through the MIGS option. Grades earned in MIGS courses may be applied toward the Home Institution grade point average or used for credit toward a graduate degree as allowed by the Home Institution’s policy.

All Guest Students are:

- Subject to all UM-Dearborn admission and registration regulations.
- Admitted for one term only. Additional registration under this status requires a new application each term.
- Assessed regular UM-Dearborn graduate tuition and related fees for all courses elected.
- Not eligible for financial aid from UM-Dearborn.
- Responsible for determining if credit earned as a Guest student will be accepted by their degree-seeking program of interest if applicable.
- Registered on a space-available basis.
- Prerequisites, grading standards, class assignments, and attendance requirements of a course apply to all students in that course. Colleges, departments, schools, and programs determine rules of access to their courses and may limit enrollment of Guest students in certain courses. Prospective Guest students should contact the relevant academic unit for further information on departmental policies and course availability.

Applicants who are interested in Guest status should complete the online Guest Application (https://umdearborn.edu/admissions/graduate/graduate-non-candidate-degreeguest-information/) (accessed via the non-degree application option).

**Michigan Intercollegiate Graduate Study**

The Michigan Intercollegiate Graduate Study (MIGS) program (https://umich.app.box.com/file/307498217784/) creates exchange possibilities for graduate students currently enrolled in Michigan universities. Students in good standing at one institution (the host) may take advantage of course and research opportunities offered at another institution (the host), provided that such opportunities are not available on the home campus. Inquiries regarding appropriate faculty contacts and administrative approval can be directed to the Office of Graduate Studies (p. 809).

**Non-Candidate for Degree**

**Non-Candidate for Degree (NCFD)** admission may be granted to qualified students who wish to elect courses for graduate credit but who are not candidates for a degree. Taking graduate-level courses (those numbered 500 or above) as an NCFD at the University of Michigan-Dearborn might be appealing to:

- Professionals seeking to continue studies without completing a full degree course of study;
- Students currently enrolled in a graduate program at another graduate school (also known as Guest students); or
- Individuals wishing to "test out" our institution before a future decision to pursue a graduate degree here.

**Important Policies**

NCFD status enables qualified individuals not in a degree-seeking program elsewhere to take a maximum of 6 credit hours for graduate credit. NCFD students register on a space-available basis.

Courses elected by students under this status cannot be counted toward a degree program until the student receives regular degree-seeking admission and the graduate program advisor determines that the courses are acceptable.

Non-Candidate for degree applicants should be aware of the following:

- Admission as a graduate non-candidate for degree student does not guarantee or imply admission or eligibility for a graduate degree-seeking program at the University of Michigan-Dearborn. To be considered for transition to a degree-seeking program, a completed graduate degree-seeking application and required supplemental materials must be submitted.
- In order for courses taken as a graduate non-candidate for degree student to be considered as credit towards a graduate degree program, relevant applicable credit evaluation or transfer credit policies should be followed. Advance communication with your program of interest is encouraged.

**NOTE:** The College of Business on the University of Michigan-Dearborn campus only offers an NCFD option for students who have already earned a UM-Dearborn master's degree.

**All NCFD Students are:**

- Subject to all UM-Dearborn admission and registration regulations.
- Admitted for one term only. Additional registration under this status requires a new application each term.
- Assessed regular UM-Dearborn graduate tuition and related fees for all courses elected.
- Not eligible for financial aid from UM-Dearborn.
- Responsible for determining if credit earned as a NCFD student will be accepted by their degree-seeking program of interest if applicable.
- Registered on a space-available basis.
- Prerequisites, grading standards, class assignments, and attendance requirements of a course apply to all students in that course. Colleges, departments, schools, and programs determine rules of access to their courses and may limit enrollment of NCFD students in certain courses. Prospective NCFD students should contact the relevant academic unit for further information on departmental policies and course availability.

Applicants who are interested in NCFD status should complete the appropriate online application (accessed via the non-degree online application). Additional information can be found on the Graduate Non-
Readmission

Most students who have not been enrolled in a master's program for one year (12 months) must use the Application for Graduate Readmission form (https://umich.app.box.com/v/grad-readmit/). Readmission is dependent upon program approval and availability of space and facilities for the term in which readmission is requested. Before readmission can be finalized for international students, proof of adequate funding is required in order to obtain the appropriate visa documents.

If a student withdrew for health reasons, readmission may be subject to satisfactory evidence that the condition has been remedied. If a student was on conditional admission, academic probation, or extended probation, that standing will continue if he or she is readmitted, unless approval to remove or modify the status is granted. If a student was required to withdraw, readmission may be granted only following approval by the program.

Retired Person Studies Program

Founded in 1984, the Retired Persons Studies Program (RPSP), formerly known as Retired Persons Scholarship Program, is a University of Michigan-Dearborn program for retired Michigan residents 60 years of age and older who seek intellectual engagement and stimulation. Through its commitment to nontraditional constituencies, UM-Dearborn continues its outstanding tradition of extending quality and excellence in education to the residents of southeast Michigan.

Beginning Fall 2019, students in the RPSP program will enroll with the following new stipulations:

Tuition and Fees

A special tuition rate for the program, set approximately at 25% of the in-state tuition is approved annually by the Regents in mid-summer. RPSP students are also subject to all applicable registration fees and college-specific premiums. The new rate each fall term will be published on the Registrar’s Office website.

Registration

Given the intellectual enrichment nature of the RPSP program, students enrolled in it will register under the Non-Candidate for Degree (NCFD) option. RPSP students should consult the campus’ graduate and undergraduate academic policies for the number of credit hours allowed under the NCFD option. NCFD students cannot register for internship and co-op courses. In addition, students will be permitted to register only after degree-seeking students as specified in the Registrar’s Registration Timetable.

Academic Credit

Students enrolled in the RPSP program can only take courses under the audit option. It is important that students considering a degree at the university not enroll under the RPSP program, as courses taken under the audit option do not carry academic credit and are not transferable into a degree program.

Admission Requirements

Please consult with graduate admissions (https://umdearborn.edu/academics/graduate-studies/office-graduate-studies/) (if seeking to enroll in graduate-level courses) or undergraduate admissions (https://umdearborn.edu/admissions/undergraduate/contact-admissions/)(if seeking to enroll in undergraduate courses) for RPSP admission requirements.

Prospective students are required and expected to:

- Have reached their 60th birthday prior to the semester of their first registration under this program.
- Be a "retired" person - to have no current career or employment.
- For undergraduate coursework, have graduated from high school (or equivalent) and demonstrate the potential to succeed in academic coursework. For graduate coursework, have completed a bachelor’s degree from an approved institution. Criteria vary based on whether a bachelor’s degree was earned from a US institution (https://umdearborn.edu/admissions/graduate/how-apply/basic-admission-requirements/us-regional-accreditation/) or an institution outside of the United States (https://umdearborn.edu/admissions/graduate/how-apply/basic-admission-requirements/international-graduate-degree-requirements/). All incoming students (undergraduate or graduate) must meet the posted minimum English proficiency standards. Appropriate education, career or life experience will be given special consideration.

Advising

Admitted RPSP students can obtain information and guidance from the academic advising offices (https://umdearborn.edu/students/academic-advising/) and faculty advisors in the colleges where they plan to take courses.

Current RPSP students seeking a degree as of Summer 2019 will be grandfathered under the previous policy and thus will be allowed to continue to the completion of their degree provided active student status is maintained (at least one course per 12 month period).

Second Master's Degree

Admission to a master's degree program in the same field of specialization and at the same level as one previously completed is possible only if the previous degree program was of substantially different character or was not accredited.

Visiting Scholar

Admission as a visiting scholar may be granted to qualified individuals who wish to study and/or conduct research at the University of Michigan-Dearborn. The general purpose of the Exchange Visitor Program is to promote international educational and cultural exchange to develop mutual understanding between the people of the U.S. and other countries. At UM-Dearborn, there are three types of J-1 exchange visitors: students, scholars, and professors. An exchange visitor must not be a candidate for a tenure-track position. J-1 students must be admitted to a degree program for a full course of study or be engaged full time in a non-degree course of study. Visiting scholars are generally invited by a host faculty or department, or supported by a program agreement. Details are coordinated with the Office of International Affairs. They can be reached at 313-583-6600 or umdoia-international@umich.edu.

Financial Aid & Scholarships

Office of Financial Aid and Scholarships
4901 Evergreen Road
1183 University Center
Financial Assistance Available

Financial aid for graduate students consists of the following types of assistance: gift aid (scholarships, fellowships, and other funds from private sources), loans, and employment. Graduate students should contact their department for possible stipends or fellowships and will need to complete the Free Application for Federal Student Aid (FAFSA (https://fafsa.gov)) in order to be considered for financial assistance by the Office of Financial Aid and Scholarships (OFAS).

Most financial aid sources require a minimum of at least half-time enrollment (4 or more credit hours per semester) in coursework that counts toward degree requirements.

Admission into an eligible program of study (i.e., a degree-granting program) is primary criterion to receive financial aid funding. All Personal Enrichment, English Proficiency, and Non-Candidate for Degree status students are ineligible for financial aid. Most Guest, Prospective Degree status, and Alumni Enrichment students are ineligible for financial aid; however, there are limited exceptions which may be applicable to specific situations. Students admitted via Guest, Prospective Degree, or Teaching Certificate status should come in to talk with a Financial Aid Officer to discuss their specific admission status and financing options.

Determining Eligibility

With the exception of some scholarships and graduate loans, financial assistance awarded by the Office of Financial Aid & Scholarships is based upon financial need as determined by a careful review of the resources of the student and the student’s household.

Need for financial aid is determined by the following calculation:

Cost of Attendance/Budget (COA) - Expected Family Contribution (EFC) = Financial Aid Eligibility (Need)

To determine the Expected Family Contribution (EFC), the calculation formula used is the Federal Methodology as mandated by the U.S. Congress. By completing the Free Application for Federal Student Aid (FAFSA (https://fafsa.gov/)), the student’s family contribution is calculated and reported on the Student Aid Report (SAR) which is emailed or mailed to the student’s home by the federal processor.

Note: Most foreign students are not eligible for federal student aid from the U.S. Department of Education. There are, however, some instances in which noncitizens may be eligible for financial aid from the U.S. federal government. To learn more, visit: studentaid.ed.gov/sa/eligibility/non-us-citizens (https://studentaid.ed.gov/sa/eligibility/non-us-citizens/).

Application for Financial Aid

Most assistance is committed at a certain time of the year, so be mindful of application dates. Dates assume entrance for the fall semester.

New Students

1. After October 1, preceding Fall enrollment, complete the Free Application for Federal Student Aid (FAFSA). Students must apply online at fafsa.gov (http://www.fafsa.gov). Include student FSA ID. Release the FAFSA information to the University of Michigan-Dearborn by entering our Federal Title IV School Code 002326. Students should use their Federal Income Tax Returns (Form 1040) to complete the FAFSA. FAFSA results received in the Office of Financial Aid & Scholarships (OFAS) by the recommended priority deadline will receive first priority consideration for funds.

2. Upon review of your FAFSA, the Federal Processor will provide you with a Student Aid Report (SAR). The Federal Processor will forward an electronic SAR to the email address you provided on the FAFSA. The OFAS will receive your information electronically (assuming you have released the information to UM-Dearborn as described in #1 above).

Continuing Students

Students currently enrolled must apply every year at fafsa.gov (https://www.fafsa.gov) after October 1 preceding fall enrollment. Applications, SARs, and/or ISIRs (resulting from the FAFSA) must be received in the Office of Financial Aid & Scholarships.

Summer

Summer is a separate processing period. Applications for Summer aid are available in late March/early April.

Reminders

1. Financial aid applications are processed only after a student has been admitted, but students need not wait until they are admitted to apply for financial aid.

2. Applications submitted after the stated dates will be considered, subject to the availability of funds, but notification may not come until after the term has begun.

3. Students must re-apply for financial aid each year.

4. All correspondence and documents must include the student’s legal name and UMID number.

Award Notification

New Students

Incoming students are notified in writing via U.S. mail of their initial financial aid offer. Thereafter, communication is via Email and UM-Dearborn Connect (see below).

Current/Returning Students

Students are encouraged to regularly check their UM-Dearborn Email account and access their UM-Dearborn Connect account for award notification and other communication from the Office of Financial Aid & Scholarships. Email communication sent to student’s UM-Dearborn Email address directs students to recent notices or activity on UM-Dearborn Connect.
Additive Credit

Additive credits courses do not count toward any degree requirements. Additive credits include most co-op/internship courses, which will not count towards enrollment for financial aid eligibility.

Award Procedures

All financial aid awards are made in accordance with three criteria: demonstrated financial need, the student’s ability to maintain satisfactory academic progress and availability of funds. Completed files are processed on a first-come, first-served basis. A financial aid file is complete only after the following documents or information have been received:

- A completed FAFSA on file with the U.S. Department of Education. The processed FAFSA must be valid and have the University of Michigan-Dearborn school code (002326) listed so that OFAS can obtain the results electronically.
- The submission of all other information requested by the Office of Financial Aid & Scholarships (required prior to disbursement of federal aid), including verification documents if necessary.

Once a student's financial aid file has been reviewed and deemed complete by a financial aid counselor, a financial aid package will be processed and an award notification will be mailed or Emailed to the student. The initial financial aid package will be based on assumed enrollment of at least half-time (4 or more credit hours) status for the fall and winter semesters. Financial aid awards can be viewed on UM-Dearborn Connect.

Repeating Coursework

Federal financial aid programs can only pay for one repeat of a passed course (passed meaning grade “C” or higher). For example, if a student enrolls and earns a grade of “C” in a course, the student's enrollment status for financial aid eligibility. If the student enrolls for a third time, financial aid will not include the course in the student's enrollment status for financial aid. If a student enrolls and earns a grade of “C” in a course, the student's enrollment status for financial aid will include that course attempt. If a student enrolls a second time in the same course, the course will be included in the student's enrollment status for financial aid. If the student enrolls for a third time, financial aid will not include the course in the student's enrollment status for financial aid. When a course is repeated, the previous enrollment is deducted from the calculation of successfully completed courses; therefore, this will lower your Cumulative Completion Rate.

The University of Michigan-Dearborn may allow a successfully-completed course to be repeated beyond financial aid limitations. Only the last grade received is counted in the CGPA.

Types of Financial Aid

Graduate Fellowship, Teaching or Research Assistantship Support

Recipients of these awards must be appointed or nominated by a member of the academic department in which the applicant is enrolled. The number of awards varies annually, as do the award amounts.

UM-Dearborn Current Student Scholarship Program (for Graduate Students)

The scholarships in the Current Student Scholarship Program are made available through the generous gifts of private donors and alumni of UM-Dearborn.

Students who have completed a minimum of 6 credit hours as a Graduate student at UM-Dearborn can apply for several university scholarships at one time using the University of Michigan-Dearborn Current Student Scholarship Application Portal. This application becomes available each year with most scholarships having a deadline of March 1st.

There are a number of different scholarships that graduate students may qualify for through this annual process. Scholarship descriptions as well as the application can be found on the following Office of Financial Aid & Scholarships website: umd.umich.academicworks.com/opportunities (https://umd.umich.academicworks.com/opportunities/).

Additional opportunities for scholarship funding may be available from other sources and would require a separate application.

City Year Detroit Alumni Scholarships

The University of Michigan-Dearborn salutes City Year Detroit Program participants for their service and metropolitan impact. The University of Michigan-Dearborn will award at least 2 two-year scholarships to students who successfully complete the City Year Detroit experience. Up to $5,350 is available each year, up to two years (four semesters). This scholarship is a match scholarship, awarded during every academic year period (September through August; Fall/Winter/Summer semesters). Graduate students are eligible for consideration.

To be considered for a City Year Alumni Scholarship, the student must provide City Year documentation (signed City Year Certificate of Graduation) to the Director of Admissions and Orientation (1145 University Center) after admission. The Office of Admissions and Orientation will make the scholarship offer and notify the Office of Financial Aid & Scholarships to place the scholarship on the student’s account.

Community Service Personnel Scholarships

The University of Michigan-Dearborn provides a scholarship valued at 20% of tuition and fees for public safety employees at partnering organizations. The scholarship is available for degree-seeking students and can be used for undergraduate and graduate programs. For more information, visit: umdearborn.edu/students/financial-aid/types-aid/scholarships/freshman-scholarships/more-freshman-scholarships/community-service-personnel-scholarship (https://umdearborn.edu/students/financial-aid/types-aid/scholarships/freshman-scholarships/more-freshman-scholarships/community-service-personnel-scholarship/).

Center for the Education of Women Scholarships

The CEW Scholarship Program for women and nontraditional students was established in 1970 to honor the academic performance and potential of women whose education has been interrupted and to commemorate the one hundredth anniversary of the admission of women to the University of Michigan. Thanks to the generosity of individuals and foundations, CEW has awarded over 1600 scholarships since 1970. CEW Scholarship Awards are invaluable, since they often mean the difference between completing a degree or not doing so for many students at the University of Michigan. Due to the generosity of donors, CEW was able to expand the program in 2008 to include additional scholarships for students of all genders.

Approximately 40 Scholarships are awarded annually ranging from about $1,000 to $10,000, with some larger scholarship awards given. For more information, visit: cew.umich.edu/funding/scholar (http://www.cew.umich.edu/funding/scholar/).

King-Chavez-Parks Future Faculty Program
The King-Chavez-Parks Future Faculty Fellowship Program is funded by the State of Michigan and is intended to increase the pool of traditionally underrepresented candidates pursuing faculty teaching careers in postsecondary education. Preference may not be given to applicants on the basis of race, color, ethnicity, gender, or national origin. Applications are encouraged from minorities, women, people with disabilities, and individuals from cultural, linguistic, geographic, and socio-economic backgrounds who would otherwise not adequately be represented in the graduate student and faculty populations. The amount of the KCP Future Faculty Fellowship Award will depend on the student's financial needs. The maximum available award for master's students is $20,000 and for doctoral students is $35,000. These amounts may be distributed over a two-and-a-half year period for Masters Fellows and over a four to six year period for Doctoral Fellows. For more information, visit: umdearborn.edu/students/financial-aid/types-aid/scholarships/king-chavez-parks-initiative-future-faculty-fellowship-program (https://umdearborn.edu/students/financial-aid/types-aid/scholarships/king-chavez-parks-initiative-future-faculty-fellowship-program/)

TEACH Grant (Teacher Education Assistance for College and Higher Education)

Funded by the federal government, the TEACH Grant provides up to $3,764 per year for students whose intention is to teach in a “high need field” (subject area), in an elementary or secondary school serving students from low-income families. As a recipient, students agree (in advance of receipt) to teach a “high need field,” full-time, for a minimum of four years within the eight years following program completion (or progress interruption from the program for which the grant was awarded). The FAFSA is required to be considered for a TEACH Grant. However, recipients do not have to demonstrate “need.”

The TEACH Grant will remain a grant if recipients meet the specific criteria. If recipients do not meet the criteria, the TEACH Grant converts to an unsubsidized loan with interest calculated back to the initial disbursement date(s). For this reason, UM-Dearborn has defined our eligibility criteria as cautiously as possible.

The population UM-Dearborn currently considers for the TEACH Grant are Seniors (at the undergraduate level) and graduate level students, with a high Cumulative Grade Point Average (CGPA), admitted into a degree-granting program of the College of Education, Health, and Human Services, and pursuing majors that align with the “high need fields.”

The cumulative grade point average requirement for the TEACH Grant 3.25 (on a 4.0 scale). The degree programs currently considered are: Master of Arts, Master of Arts in Teaching, and Master of Science. Eligible majors at UM-Dearborn are: Education, General Science, Mathematics, Mathematics Studies, Reading, Science Education, Science Studies, Special Education and Teaching.

Loans

Eligibility for the following Federal loan programs require adherence to Federal fund criteria, maintenance of the University's Satisfactory Academic Progress guidelines, and minimum enrollment of at least half-time (4 or more credit hours). Requirements are subject to change over time. Additional documents may be required (e.g., Promissory Notes and Entrance Counseling) prior to disbursement of funds.

William D. Ford Federal Direct Loan Program

Federal Direct Loans are available through the William D. Ford Federal Direct Loan Program. Under the Federal Direct Loan Program, funds are lent to student or parent borrowers directly by the U.S. government. There are several types of Direct Loans: the Federal Direct Subsidized Loan (Subsidized FDSL), Federal Direct Unsubsidized Loan (Unsubsidized FDSL), Federal Direct Parent Loan for Undergraduate Students (FDPLUS), Federal Direct PLUS Loan for Graduate Students, and the Federal Direct Consolidation Loan program. Graduate students are not eligible for the Federal Direct Subsidized Loan program.

Unsubsidized Federal Direct Loan

Those borrowing an Unsubsidized Loan are assessed interest starting at the time of disbursement. Interest is automatically deferred until loan repayment begins. However, to avoid capitalized interest a student may pay interest while enrolled, which will result in lower loan payments over the life of the loan and a lower long-term cost.

Because Federal Direct Loan awards have origination fees, the Direct Loan amounts applied to your University student account will be lower than those listed on your Award Notice.

Annual and Lifetime Federal Direct Student Loan Limits

Annual limit $20,500 up to the Cost of Attendance, whichever is less

The program aggregate (maximum borrowing) is $138,500. Graduate loan debt includes Federal Direct Student Loans received as an undergraduate.

Federal Direct PLUS Loans for Graduate Students

Direct PLUS Loans are part of the federal Direct Loan Program, which makes loans directly from the U.S. Dept. of Education.

The Graduate Student must apply for PLUS loans separately if they need additional funds to cover costs. To be eligibility for a Graduate PLUS loan the student must first exhaust Unsubsidized Loan eligibility. Eligibility is not based on need and borrowers may obtain up to the Cost of Attendance minus any other financial assistance received.

There are certain requirements to qualify for the PLUS loan and the federal processor will access your credit report as part of the application process. Because credit checks are valid for a limited time, applications for the Fall and/or Winter terms should be completed beginning in early June. Applicants must complete the FAFSA before eligibility for the PLUS Loan can be determined. You must reapply each year.

Federal Direct Consolidation Loan

Federal Direct Consolidation Loans are designed to help borrowers simplify loan repayment. This loan allows the borrower to consolidate several types of federal educational loans with various repayment schedules into one loan, requiring only one payment per month. Interest rates, however, may differ depending on the loan category as well as repayment and deferment options for the borrower.

Borrowers in default on a previous federal education loan may be able to obtain a Direct Consolidation Loan as a method of resuming the educational process and regaining eligibility for financial aid funds. (Those in default are ineligible for any and all financial aid while the default status is unresolved.)

Those interested may contact their Direct Loan Servicer or access their web site studentloans.gov (http://studentloans.gov/) for additional information.
Student Employment

Federal Work-Study Program—Federal Work-Study is a Title IV program offering part-time work for students who demonstrate financial need. Students work up to 25 hours per week during the regular semester, depending upon the student’s financial need, availability of federal funds, and the student’s class schedule. Seven percent of the school’s annual Federal Work-Study allocation will be used to fund community service jobs.

Work-Study awards are earned by working for Work-Study employers and earning a paycheck, typically paid bi-weekly through the employer’s payroll system. Work-Study earnings will not credit your tuition and fees bill. Employers pay a percentage of students’ wages and federal funds pay the remaining wages.

University openings are posted on careers.umich.edu (http://careers.umich.edu/). You can also contact the Office of Career Services (https://umdearborn.edu/students/office-career-services/) for assistance with Off-Campus openings. You must show the employer a copy of your Award Notice and proof that your enrollment is at least half-time (4 or more credit hours) and inform your employer if your Work-Study eligibility changes.

On-Campus Employment

On-campus employment is funded by UM-Dearborn, when not funded by Federal funds. There are many part-time and temporary jobs available in the academic departments and in the support offices. Eligibility for Federal financial aid funds is not a requirement for University employment. Students may contact the Office of Career Services (https://umdearborn.edu/students/office-career-services/) to inquire about job availability. The departments pay 100 percent of these wages. To locate an on-campus job, visit careers.umich.edu (http://careers.umich.edu/).

Other Sources of Financial Aid

Other sources of financial assistance are available through government agencies such as Vocational Rehabilitation, Veterans Administration, and Social Security. Students needing information on these programs should contact the nearest appropriate agency.

Assistance for educational expenses may also come in the form of tax allowances. The Internal Revenue Service publishes Publication 970. Publication 970 provides information on educational benefits allowed within the tax code. Publication 970 may be obtained from the Internal Revenue Service or viewed online at irs.gov/publications/p970 (http://www.irs.gov/publications/p970/).

Satisfactory Academic Progress

Satisfactory Academic Progress

Satisfactory Academic Progress policy

Satisfactory Academic Progress (SAP) describes a student’s successful completion of coursework toward a degree. SAP is monitored at the end of each semester (Fall, Winter, Summer). To maintain SAP, a student must:

- SAP is monitored at the end of each semester (Fall, Winter, Summer).
- Students must complete academic program within 150% of published length of program. For transfer students: The number of transfer hours accepted at the point of admission are used to calculate a student’s remaining eligibility under the 150% standard and will be included in the quantitative calculation which includes number of credits attempted and completed.
- Graduate students must complete at a minimum rate of 67% of attempted courses.
- Graduate students must maintain 3.0 CGPA or higher if required by your academic unit.
- For second graduate degree students: These students are eligible to receive only loan funds within the program aggregate. Second-degree students are given 150% of stated credit hours required for the second degree program.

Satisfactory Academic Progress Standards

Students who receive financial aid must demonstrate SAP as determined by the University of Michigan-Dearborn in accordance with federal regulations. Financial aid recipients are required to be in good academic standing and to maintain SAP toward their degree requirements for each semester in which they are enrolled. SAP is required to maintain eligibility for financial aid. The requirements for financial aid may be different than those required by one's academic unit. The standards of Satisfactory Academic Progress measure a student's academic progress using both qualitative and quantitative measurements. These measurements include a Cumulative Grade Point Average (CGPA) requirement, a Cumulative Completion Rate requirement, and a Maximum Timeframe requirement. In addition, certain types of courses are limited or excluded from eligibility. The standards apply to all federal financial aid programs and programs funded and administered by the University of Michigan-Dearborn Office of Financial Aid and Scholarships and include degree, certificate, and consortium guest students who receive financial aid. SAP is evaluated at the end of each term (Fall, Winter, and Summer). Federal regulations require the University of Michigan-Dearborn to evaluate all students for SAP regardless of whether or not they receive financial aid. SAP is evaluated based on the student's cumulative academic record, from the date of entry to the university.

Cumulative Grade Point Average (CGPA) The qualitative measurement assesses the student’s Cumulative Grade Point Average (CGPA).

- Graduate/Professional Students: The minimum CGPA requirement is a 3.00 or higher if required by your academic unit.

Completion Rate The quantitative measure assesses the pace at which a student progresses towards a degree. To ensure progress, students are required to complete a minimum percentage of all attempted courses. Attempted courses are those for which a student is enrolled at the conclusion of the Add/Drop period for a semester (those that appear on the academic transcript). Graduate students must complete attempted courses at a minimum rate of 67%.

Maximum Timeframe (MTF) Federal regulations require that a student must complete his or her educational program within a Maximum Timeframe (MTF) no longer than 150% of the published length of the educational program measured in academic years, terms or credit hours attempted. Students who fulfill this minimum rate of course completion and follow departmental recommendations on course selection should complete their degree within the Maximum Timeframe.

Transfer Credits Courses that are transferred from another institution and accepted toward an academic degree program at the University (at the time of SAP Review) count as attempted and completed hours for Completion Rate and Maximum Timeframe (MTF). The CGPA is determined only with courses taken in residence at the University.

Grades, enrollment/withdrawal and repeated classes
GRADES: Only courses for which a student receives a grade of A, B, C, D, I, or P are acceptable. A grade of E, UE, F, ED, W, NR, or X is not acceptable. Students who fail to complete at least 67% of attempted credit hours because of incomplete grades or who withdraw from all classes will be placed on probation for one semester. If they still fail to meet the 67% completion rate, their financial aid will be terminated. A student may receive financial assistance for a course that was repeated and for which a non-passing grade was received.

REPEATED CLASSES: Students who receive a passing grade may repeat that class once and have that enrollment considered for financial aid. (Repeating classes that do not result in additional hours earned will not improve completion rate.)

TERMS WITH FAILING GRADES: Office of Financial Aid and Scholarships will be verifying attendance during a term in which all grades received are unacceptable (as defined above). Failure to verify attendance in each class will result in cancellation of all aid for the term.

REGAINING AID ELIGIBILITY: A student may regain eligibility by notifying the UM-Dearborn Office of Financial Aid and Scholarships when these three things have been accomplished:
1. Complete a minimum of 8 credit hours for graduate students at UM-Dearborn (or as specified in the Academic Plan) without the benefit of financial aid. Students may take the credits at another institution of higher education if approved by their academic advisor; and,
2. Achieve a minimum GPA of 3.0 for graduate students; and,
3. Complete 100% of attempted credit hours.

NOTE: For more information regarding Satisfactory Academic Progress and how it affects your financial aid see the complete policy online at umdearborn.edu/students/financial-aid/consumer-information/standards-academic-progress/ (https://umdearborn.edu/students/financial-aid/consumer-information/standards-academic-progress/).

Return of Title IV Funds

Return of Title IV Funds

Students sometimes find it necessary to withdraw from all classes during a semester. Depending on when this occurs, students may receive a refund of all or part of tuition and fees. If the student is a financial aid recipient, the University and student may be required to return the aid, or a portion of it, to the federal government.

Tuition Refund Policy: The University has a tuition refund policy stipulating the amount of tuition and fees refunded to a student who withdraws from all classes during a term. The Registrar’s Office determines specific tuition refund dates each term (umdearborn.edu/students/registration-records/academic-calendar-important-dates) and selects "Registration Deadlines" for the specific semester. Students must notify the Registrar’s Office immediately by following specific withdrawal procedures. Visit umdearborn.edu/students/registration-records for hours of operation.

Unofficial withdrawals

The federal government considers an unofficial withdrawal one in which a failing grade is received when a student does not attend, or stops attending, a class for which he/she is enrolled. In these cases, students can be required to repay aid received. If you have questions about enrollment and aid eligibility, contact the Office of Financial Aid and Scholarships for assistance.

Allocating returned Title IV (federal) financial aid

Funds returned to the federal government reimburse the individual federal programs from which the student received the aid. Financial aid returned (by the university and/or the student or parent) must be allocated, in the following order, up to the net amount disbursed from each source:
1. Federal Unsubsidized Direct Loan
2. Federal Subsidized Direct Loan
3. Federal Perkins Loan
4. Federal Direct PLUS (Parent) Loan or Grad PLUS Loan
5. Federal Pell Grant
6. Federal Supplemental Educational Opportunity Grant (FSEOG)
7. Other Federal Loan or Grant Assistance

Return of Title IV (federal) financial aid

The Office of Financial Aid and Scholarships is notified by the Registrar when a student has officially withdrawn from the University. The federal government mandates that students withdrawing from all classes may keep only the financial aid they have “earned” up to the time of withdrawal.

Title IV funds disbursed in excess of the earned amount must be returned by the University and/or the student to the federal government. The student could owe the University, the government, or both.

The calculation for Return of Title IV funds is based upon the date on which a student initiates the withdrawal process by indicating intent to withdraw. This is either by speaking with an academic advisor, member of the Registrar’s staff, or completing the University’s withdrawal form.

Students who withdraw will have academic activity confirmed by their instructors to determine the last date of attendance. Failure to receive attendance or participation, from instructors, will result in cancellation of all aid for that semester.

To determine what a student earns, we:

• Divide the number of calendar days the student has attended classes by the total number of calendar days in the semester (minus any scheduled breaks of 5 days or more).
• The resulting percentage is multiplied by total federal funds disbursed (either to the student’s University account or to the student directly by check or direct deposit) for the semester.

• This calculation determines the amount of aid earned that a student may keep. (For example, if the student attended 25% of the term, he will have earned 25% of the aid disbursed. The unearned amount must be returned to the federal government by the University and/or the student.)

We will notify students who are required to return funds to the government. In some instances, students who withdraw may be eligible for a post-withdrawal disbursement of "earned" aid. The following conditions must be met for the student to be considered eligible:

• The student must have submitted a valid FAFSA to UM-Dearborn prior to date of withdrawal.
• UM-Dearborn must have made an offer of federal aid to the student. In the case of a Direct Loan, the University must have originated the loan with the U.S. Department of Education, must have
documentation that the student signed a loan promissory note, and must be making the first disbursement of the loan.

Students considering withdrawal from all classes should contact the Office of Financial Aid and Scholarships and their academic advisor so that the consequences of withdrawing from all classes can be explained. Financial aid counselors can further explain this policy to students and parents.

Student Consumer Rights and Responsibilities

Section 493.A of the Higher Education Act requires post-secondary educational institutions to disseminate relevant, candid information on student financial aid programs available at the college. Any change in a student’s financial situation, address, or school enrollment must be reported to the Office of Financial Aid & Scholarships. Students have the right to request a review of their financial aid package when a change in family or personal circumstances occurs. Students also have a right to review their financial aid records and may do so during counseling hours.

Information Dissemination and Report Disclosure

The U.S. Department of Education requires UM-Dearborn to disseminate information and disclose certain information to students. This information includes, but is not limited to: Voter Registration, Equity in Athletics, Campus Crime and Security, Completion and Transfer-Out Rates, and Drug and Alcohol-Free Campus policies. For further information on the listed topics, please refer to the University website at umdearborn.edu/students/financial-aid/consumer-information (https://umdearborn.edu/students/financial-aid/consumer-information/).

Registration & Records

Office of Registration and Records
4901 Evergreen Road
1169 University Center
Dearborn MI 48128
313-583-6500
313-593-4896 [FAX]
registrars@umich.edu
umdearborn.edu/registration (http://www.umd.umich.edu/registration/)

The mission of the University of Michigan-Dearborn Office of the Registrar is to provide accurate academic record information and policy services to faculty, staff, students, alumni, the administration and external constituencies. The ES/R&R collects and disseminates student, course, and instructional information through processes that ensure the integrity and security of all academic records particularly with regard to the Family Educational Rights and Privacy Act (FERPA) as set forth by the Federal Government.

The Office is responsible for all aspects of student registration and academic records. The office’s primary functions include schedule preparation, registration, grade processing and custodianship of student records. In addition, we are charged with the responsibility of communicating and administering academic policies, which we endeavor to enforce consistently and fairly. These activities are integral to the educational activities of the University, thereby supporting the primary mission, aspirations, and goals of the University of Michigan-Dearborn.

Auditing

Students are expected to elect courses for credit. The student’s program advisor, however, with the concurrence of the instructor involved, may grant official auditing privileges when they are warranted for educational reasons. A student auditing a course is charged the usual fee for that course. Any specific conditions must be enunciated by the instructor at the time permission is granted for the audit.

Change in Course Elections: Add, Drop, Withdrawal

(See Also “Change of Fees And Refunds”)

Changes in course elections include adding a course(s), dropping a course(s), substituting course(s), and withdrawing (discontinuing) all courses. All students will process their add/drop and withdrawals online or at the Office of the Registrar’s (1169 UC, with signatures when appropriate).

Please consult the section on “Change of Fees and Refunds” for the impact on tuition and fees.

Add

A student may add courses or change a standard graded course to Pass/Fail or Audit during the first two weeks of a full term, the first week of a half term or mini-term, or before the second class meeting of a less than one-month mini-term. Any exceptions for adding courses must be approved by the student’s academic unit.

Drop

A student may drop a course(s) during the first two weeks of a full term, the first week of a half term or mini-term, or before the second class meeting of a less than one-month mini-term. No record of the student’s brief enrollment will be recorded.

Courses may be dropped during the third through the ninth week of classes in a full term, during the second through the fourth week of classes in a half term or mini-term, and before the third class meeting in a less than one-month mini-term.

The effective date of the drop is the date the drop form is received and signed at the Office of the Registrar’s counter.

Permission to drop courses under circumstances other than stated above will require the approval of the student’s academic unit.

Withdrawal

A student may discontinue all of his/her courses through the last day of classes (for the term) by withdrawing from the term. The completed form must be presented to the Office of the Registrar’s Counter for processing. The effective date of the withdrawal is the date the withdrawal form is received and signed at the Office of the Registrar’s Counter.

If a student withdraws (drops all courses) from a term during the first two weeks of classes in a full term, the first week of classes in a half term or mini-term, or before the second class meeting in a less than one-month mini-term, no record of the student’s brief enrollment will be recorded. Beyond those deadlines, the mark of W will appear on the transcript.
Permission to withdraw under circumstances other than stated above will require the approval of the student's academic unit.

Consecutive Withdrawals
Every student’s academic record is reviewed for the purpose of observing academic progress at the end of each term in which the student is enrolled. A student who has not enrolled for one calendar year or who has withdrawn for two consecutive terms must apply for readmission and may not re-register without the explicit written permission of the student’s unit office. (PDS/PE students see Academic Support and Outreach Services, 2136 UC.)

A student who first registers and then withdraws from two consecutive terms may be placed on academic probation and may not register without the explicit written permission of the Associate Dean or the Associate Dean’s representative.

Required Withdrawals
Unless extenuating circumstances are presented by petition, a student who is required to withdraw from one academic unit may not be admitted to another UM-Dearborn academic unit within the same term as that in which such withdrawal action is taken.

Refunds and Financial Aid
Students receiving Title IV financial aid may be required to repay some or all of the financial aid received for a term in which the student withdraws. Students required to repay financial aid funds will have the refunds allocated to financial aid programs in the following order: Federal Direct Loans, Federal Perkins Loans, Pell, SEOG, other Title IV, federal, state, private, and institutional programs and finally, to the student. Students receiving financial aid and considering withdrawal should seek the advice of a Financial Aid Officer prior to taking such action.

Change of Fees and Refunds
When appropriate, a change of fees will be processed by the Office of the Registrar when a student submits an "Add/Drop/Registration Form" or "Withdrawal Form" which affects the fee previously assessed. Individuals are also advised to see "Change in Course Elections" in this Catalog.

Refunds of tuition, fees, or student account credit balances are generated automatically. After authentication and processing, the refund is issued to the student.

Adding
A student who increases the number of hours elected will have a new fee assessment generated by the Office of the Registrar indicating the appropriate fees to be paid.

Dropping (for Full, Half, and Four-Week Mini Courses)
A student who, during the first two weeks of a full term or the first week of a half term or mini-term reduces the number of hours elected, will have a new fee assessment generated by the Office of the Registrar indicating the appropriate fees to be paid. No reduction in fee assessments will be made after the end of the second week of classes (first week of a half-term) except in cases of withdrawal from the University.

Dropping (for less than One-Month Mini Courses)
A student may drop from a less than one-month mini-course on or before the first class meeting of such a course without financial penalty. Thereafter, full tuition will be assessed and the academic record will reflect the symbol for withdrawal ("W").

Withdrawing (for Full, Half, and Four-Week Mini Courses)
A student who withdraws from UM-Dearborn is assessed as follows:

1. Students who withdraw prior to the first day of classes will not be charged any tuition assessments or fees.
2. Students who withdraw during the first week of a half term or mini-term, or during the first two weeks of a full term, will not be charged any tuition assessments or fees.
3. Students who withdraw during the second through third week in a half term or mini-term, or in the third through sixth week of a full term, will be charged 50% of the tuition assessed, as well as the non-refundable registration assessment. In addition, there is no reduction in lab/course fees.
4. Students withdrawing after the time periods indicated in Paragraph "3" will be assessed full tuition and fees.

Withdrawing (For Less Than One-Month Mini Courses)

1. Students who withdraw from a less than one-month mini course before the first class meeting of such a course will not be charged any tuition assessments or fees.
2. Students who withdraw from a less than one-month mini course on the first day of class will not be charged any tuition assessments or fees.
3. Students who withdraw from a less than one-month mini course on the second day of class will be assessed 50% of the tuition assessed, as well as the non-refundable registration assessment. In addition, there will be no reduction in lab/course fees.
4. After the second class meeting of such a course, the student shall pay all fees and assessments.

Grades and Grading

- Change of Grade (p. 831)
- Grade Notations (p. 832)
- Grading Benchmarks (p. 832)
- Grading System (p. 834)

Change of Grade
The grade that an instructor records on the final grade sheet and that appears on the student's subsequent transcript is assumed to be final; that is, the instructor’s official evaluation of all of a student’s performance and work completed by the official end of the term (the last day of the final examination week).

The University permits a change of grade under the following circumstances:
1. Recognizing that mistakes can be made, the University of Michigan-Dearborn permits a student to ask an instructor for a review of a grade within a five week period after the end of the term involved. After the expiration of this deadline, a student may initiate a request for a review only through the petition process involving the student’s college Academic Standards Committee (or comparable group), whose decision shall be final. Such a review is entirely separate and distinct from the circumstances involving an X (Absent from Final Examination), I (Incomplete Coursework), or a Y (Course Extends Beyond Term).

2. A student (or instructor) may initiate a grade change if he/she discovers that a grade has been entered in error due to, but not exclusive to, the following:
   - possible omission by the instructor when computing the final grade, or material submitted by the student before the end of the term;
   - possible error in evaluation by the instructor of work submitted or final examination taken by the student before the end of the term;
   - possible error by the instructor in the computation of the final grade;
   - possible error in the recording of the grade by the instructor or staff; or
   - allegation of bias or prejudice on the part of the instructor in the assignment of the final grade (This rare charge is to be handled according to the procedures established within the academic unit.).

**Grade Notations**

The following notations may appear on a transcript to describe special situations in regard to a course.

- **NC No Credit.** No honor points. Not computed in the grade point average. Used only in specially approved courses that are graded A, B, C, No Credit.

- **I Incomplete.** No honor points. A student whose coursework for the term (other than final examination) is incomplete in a minor way may, upon completion and approval of the I Contract Form, be granted the privilege of completing the work within a five-week period for the College of Engineering and Computer Science or the College of Business, and a four-month period for the College of Arts, Sciences, and Letters and College of Education, Health, and Human Services beginning on the first day of classes of the immediately following term. If granted this privilege, a grade of I will be recorded. Failure to complete the required work within the specified time, or the denial of this privilege by the instructor, may result in a grade of E for the final grade. In extenuating circumstances an extension beyond the stated period may be requested by means of a petition that has been endorsed by the instructor. However, such arrangements for completing the work must be made within the above five-week period. The grade of X will automatically be converted to XE and reflected in the student’s grade point average as a failing grade if the Supplementary Grade Report is not submitted by the end of the five-week period.

- **Y Course extended beyond term end.** No credit. No honor points. A mark of Y indicates that a course extends beyond the end of one term. This mark is only used for courses that have been specially designed and approved to extend beyond the end of one term. A course with a Y mark may not be completed after graduation. If such a course is not completed, the Y will be converted to an E upon graduation.

- **NR Grade Not Reported.** No honor points. Student should consult the Registrar immediately.

- **W Official Withdrawal.** No credit. No honor points. Not computed in the grade point average. Students who drop a course or withdraw from all courses for a term before the deadline for official drops and/or withdrawals will receive for these courses the W notation. This notation may not be removed from the transcript.

- **S/E Used only for specially approved courses.** If a student passes, an S (satisfactory) is awarded. It is not computed into the grade point average. If a student does not pass, an E is awarded. If a student stops attending, without officially dropping, a UE is awarded. Both the E and the UE are computed in the GPA as failing grades. (Exception: Failing grades in additive credit courses that are graded S/E have no impact on the GPA.)

- **P/F Pass/Fail Option.** No honor points. A student must elect to take a course under the Pass/Fail option. Please check with your college for its policy on electing courses as Pass/Fail.

- **UE Unearned Fail.** This grade is assigned to any student who has never attended, or stopped attending class during the semester and did not officially drop. It is computed in the GPA the same as an E.

- **VI Visitor-Official Audit.** No credit. No honor points. Not computed into the grade point average. An official audit, or visitor status, allows a student to attend a course but not elect it for credit. The V notation appears on the transcript. Regular tuition fees are assessed.

**Grading Benchmarks**

The University of Michigan-Dearborn seeks to provide greater clarification as to the characteristics for each grade level. The descriptions below provide greater clarification targets for each grade level.

The grading benchmarks do not establish a campus-wide mandate for faculty grading or grading outcomes. Instructors at the University of Michigan-Dearborn have the autonomy to formulate their own grading standards and system. Students should discuss and confirm with their instructor the grading system and requirements employed within their course(s).

<table>
<thead>
<tr>
<th>Benchmarks</th>
<th>Grade</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior Achievement</td>
<td>A/A+</td>
<td>4.0</td>
</tr>
<tr>
<td>Outstanding</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>A-</td>
<td></td>
</tr>
<tr>
<td>Good Achievement</td>
<td>Very Good</td>
<td>B+</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td></td>
</tr>
</tbody>
</table>
The University of Michigan-Dearborn has adopted the "Grade and Marking System" employed by St. Olaf College: catalog.stolaf.edu/academic-regulations-procedures/grades/

**Grading Benchmark Achievement Levels**

**Superior Achievement (A level)**

The grade of A recognizes exceptional performance and achievement that exceeds course expectations and consistently demonstrates, where applicable, many of the following characteristics:

- Thorough, deep, and mature understanding.
- Genuine comprehension, insight, and synthesis.
- Significant mastery of challenging topics and issues.
- Extensive familiarity with relevant literature and previous work.
- Highly developed communication skills.
- Thorough preparation and extensive, thoughtful class participation.
- Integration of knowledge, concepts, and principles across disciplines.
- Originality of analysis and interpretation.
- Technical competence in skills and procedures.
- Precision of ideas and clarity of expression.
- Thinking that is independent, creative, and focused.
- Understanding of nuance and subtlety.
- Consistent coherence in argument and discussion.

**Students who receive the grade of A consistently demonstrate, where applicable, the ability to:**

- Analyze arguments using specific examples and original sources.
- Think logically, draw inferences, and make predictions in complicated situations.
- Communicate reasoning clearly and concisely.
- Think abstractly.
- Identify strengths and weaknesses in arguments, policies, and practices.
- Integrate information to draw well-founded conclusions.
- Connect course content to issues of other courses and world affairs.
- Use models appropriately; recognize their strengths and accommodate their inherent limitations.
- Foresee and evaluate consequences of proposed policies and actions.
- Use technology creatively and effectively.

**Good Achievement (B level)**

The grade of B recognizes work that meets course expectations and typically demonstrates, where applicable, many of the following characteristics:

- Clear understanding without much originality.
- Competent grasp of course materials and subject matter.
- Familiarity with relevant literature.
- Competence in communication skills.
- Regular preparation for and participation in class.
- Integration of course knowledge, concepts and procedures.
- Some evidence of critical and creative thought.
- Clear connections between inferences and evidence.
- Care in the use of evidence and quotations with only occasional thinness in argument, detail, or precision.

**Students who receive the grade of B typically demonstrate, where applicable, the ability to:**

- Extend ideas by connecting with personal experiences, reading, or world events.
- Analyze data in various forms and from varied sources.
- Utilize information to explain events, draw conclusions, and apply results.
- Present comprehensive answers in a clear and logically correct style.
- Understand and compare various models.
- Distinguish inputs from outputs, and causes from effects.
- Recognize consequences of complex interactions.
- Use technology effectively.

**Adequate Achievement (C level)**

The grade of C recognizes work that is sufficient to prepare for continued study in the field and generally demonstrates, where applicable, some of the following characteristics:

- Adequate grasp of course concepts.
- Partial mastery of knowledge and skills required for understanding.
- Incomplete familiarity with relevant readings or references.
- Writing that lists facts rather than develops well-reasoned arguments.
- Frequent neglect of important information.
- Partial appreciation of the meaning or implications of a question.
- Answers that are insufficiently developed.
- Minimally complete assignments with many areas for improvement.

**Students who receive the grade of C generally demonstrate, where applicable, some ability to:**

- Assimilate and communicate simple knowledge and procedures.
- Extend ideas by making simple inferences.
- Make connections among and draw conclusions from course concepts.
- Interpret simple information provided in various formats.
- Organize and display data in tables and graphs.
- Use technology competently.

**Limited Achievement (D level)**
The grade of D indicates a lack of readiness to continue in the field. Students' work usually demonstrates, where applicable, some of the following characteristics:

- Minimal understanding of the subject matter.
- Poorly developed communication skills.
- Inability to apply subject matter understanding in other contexts.
- Little evidence of critical or creative thinking.
- Lack of apparent seriousness.
- Frequent carelessness in fulfilling assignments.

Inadequate Achievement (E)

The grade of E indicates that course work is insufficient to merit academic credit. Students who receive an E usually demonstrate some of the following characteristics:

- Inadequate understanding of subject matter.
- Inadequate or inconsistent preparation.
- Frequent failure to complete assignments in a timely manner.
- Little evidence of critical thought.
- Very poor communication skills.
- Frequent misunderstanding of facts or references.
- Little or no analysis.
- Confused or incomprehensible writing.
- Little or no work offering evidence that course objectives have been met.

Grading System

Grade point averages (scholastic averages) are computed by dividing the honor points a student has earned by the hours elected. The term grade point average and the cumulative grade point average are computed for each student at the end of each term and become part of the student's official UM-Dearborn academic record.

Symbols used in the grade reporting system common to all units are: F, failed (pass/fail option election); I, incomplete; NR, grade not reported; P, passed (pass/fail option election); S, satisfactory (courses graded S/E or S/U); NC, no credit; VI, audit; W, drop/withdrawal; X, absent from final examination; U, unsatisfactory (courses graded S/U only); Y, indicates the course extends beyond the term.

The grades of E, IE, UE or XE are not assigned honor points and thus will lower the student’s grade point average. The grade NC is used only for certain courses. When this grade is officially granted, the grade NC and the course will appear on the student’s transcript, but the course will not be used in computing grade point averages of students.

Students may repeat a course no more than two times. All grades received must appear on the transcript.

Grading System

The recording of grades on a student’s official academic record is governed by the following (4.0) grading system:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Honor Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A,A+</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Note: The A+ and D- grades are not used by Engineering instructors. The A+ grade is not used by Education instructors.

Grades associated with transfer credit from other schools or colleges (including other University of Michigan campuses) are neither recorded nor used in computing grade point averages of students.

Instructor Requested Drop

A student who is absent from class meetings of a course during the first week of any term and does not inform the instructor or the instructor’s department of his/her intention to continue as a class member may receive a request, by the instructor, to drop the course. The student is responsible for processing all paperwork to officially drop this or any course. Please consult the Office of the Registrar’s website for procedures on how to drop courses.

Registration Information

Academic Advising

Academic advising should be sought from the student’s school, college or graduate department office prior to registration.

Appointment Time to Register

Continuing students who are eligible to register via the Web can determine their registration date based on credits earned as listed in the registration timetable. New students and those participating in non-traditional programs will receive written information regarding their registration appointment time. The Registration Timetable is available on the Office of the Registrar’s Website (umdearborn.edu/registration/).

Closed Courses

Closed course information will be posted at the Enrollment Services Counter (1169 UC) and on the Office of the Registrar’s Website.
(umdearborn.edu/registration (http://www.umdearborn.edu/registration/)).

Course Load
Students may elect a maximum of 18 credit hours in a given semester. Students should contact their college for policies and procedures regarding electing hours in excess of the maximum.

Holds
Students will not be allowed to register if they have a hold. A hold could result from having outstanding financial obligations to the University, academic probation, mandatory advising or other academic or non-academic conditions that require resolution prior to registration. Students can check their holds on UM-Dearborn Connect. See the “View Your Holds” page located in the secure area under the Student Accounts menu.

Registration Options
UM-Dearborn offers eligible students two options for registration:

- Walk-in
- Web

1 All students (with the exception of some non-traditional programs) who have been enrolled at least one term within the last year, new graduate students, and reenrolled students who do not have financial obligations, holds or other registration restrictions are eligible to register via UM-Dearborn Connect. New transfer and new freshman students will register during New Student Orientation.

Reporting of Grades
The Office of the Registrar reports term grades to students via a Final Grade Report in UM-Dearborn Connect. Grades are also reported on each student’s Academic Transcript. Updated Academic Transcripts are available to students two weeks following the close of the final examination period. Students requiring more immediate service may contact the Office of the Registrar for assistance. (Also see “Request for Transcripts”).

Transcripts

Transcript Information
A transcript is a student’s complete academic record at the University of Michigan-Dearborn. The transcript(s) that were presented for admission have become an integral part of the files of the admitting offices and cannot be released, either directly or for copying purposes. It will be necessary for you to write directly to the institutions concerned to obtain copies of those previous records. In addition, documents such as SAT/ACT scores are not available from The Office of the Registrar. Transcripts will be released only upon written request of the student. Requests are processed within three to five business days. Under certain circumstances, such as the end of the term or upon graduation, requests may take longer to process. Requests will not be processed if you have any financial obligation outstanding to the University. No fee is required for standard delivery transcripts.

Types of Transcripts:
Official Transcripts are printed on special paper with the Registrar’s signature. Official transcripts given directly to a student will be stamped Issued to Student and may not be accepted by other universities.

Unofficial Transcripts are printed on plain paper and marked Student Copy.

Rackham Transcript Information
Students who attended Rackham, Winter 1998 through the present may direct the transcript request to the Dearborn campus as indicated above under “Dearborn Transcript Information.”

Students who attended Rackham prior to Winter 1998 or have graduated prior to January 1998 from the Rackham Graduate School must direct the transcript request to:

University of Michigan Transcript Department 555 LSA Building Ann Arbor, MI 48109-1382

Fax: 734-764-5556

Rush Transcript Information
Students may request a rush copy of their transcript in person at the Office of the Registrar’s counter. A $10.00 rush fee per transcript (cash or check only) will be required at the time of the request. Requests received prior to 12:00 noon will be ready for pickup on the same day after 4:00 p.m. Requests received after 12:00 noon will be available for pickup the following day after 12 noon.

Web Transcript Information
Students are able to view and request transcripts online via the UM-Dearborn Connect (http://web-sis.umd.umich.edu/) system. Please visit the Online Transcript Instructions (http://umdearborn.edu/rr_trans-instruc/) page for more information.

Tuition Assessment and Fee Regulation
Tuition and fees are subject to the approval of the Regents of the University and are subject to change at any time.

Policies Governing Student Tuition and Fees
The Board of Regents shall determine the level of tuition and fees and a schedule of such shall be published. All other student tuition and fees shall be fixed by the Campus Fee Committee.

Payment of Tuition and Fees
All tuition and fees are payable in accordance with regulations established by the University providing only that said regulations may not defer payment beyond the end of the term for which they are assessed.

Payment for tuition and fees may be made in full at the Cashier’s Office, or online, after registration. The laboratory and/or course fees are refundable if the course is dropped during the first two weeks of a full term, the first week of a half term or mini-term, or before the second class...
meeting of a less than one-month mini-term. The procedure for obtaining a refund is described in the section "Change of Fees and Refunds."

**Application Fees**

Graduate degree-seeking applicants must submit a $60 application fee. The application fee is nonrefundable and cannot be credited toward tuition or any other fees. When applying via the online application, the application fee can be paid by credit or debit card (Visa, MasterCard, or Discover). If a paper application is submitted, the $60 fee must be paid via check or money order (payable to UM-Dearborn).

Graduate non-degree or guest applications do not require a fee. Undergraduate applicants are not charged an application fee regardless of how they apply.

Students who have paid the appropriate application fee at another campus of the University will not be assessed a second fee.

**Course Level Assessment**

Undergraduate students electing Graduate course(s) will be assessed at the Graduate Tuition rate for the graduate course(s). Graduate courses are numbered 500 and above. (Effective Winter 2007)

Graduate students electing Undergraduate course(s) will be assessed at the Undergraduate Tuition rate for Undergraduate course(s). Undergraduate courses are numbered 499 and below. (Effective Fall 2006)

Please note: This tuition assessment is dependent on various factors and a change in tuition may not occur for some students.

**Dual Status Tuition and Fees: Graduate And Undergraduate**

Seniors who are within six hours of completing the requirements for graduation and who have been admitted to a UM-Dearborn graduate program may, with both undergraduate and graduate advisors’ approval, register simultaneously in a UM-Dearborn undergraduate unit and in a graduate program. Tuition and fees will be assessed at the graduate program level for graduate courses and the undergraduate program level for undergraduate courses.

**Dual Enrollment Tuition and Fees: On Two Campuses Of The University**

A student electing courses at UM-Dearborn and at another campus of the University, by means of a "Guest Admission," will pay the appropriate tuition and fees at each campus. The only exception is that the student will not be assessed tuition and fees totaling more than a full program tuition and fees at whichever campus may have the higher full program tuition and fees.

**Undergraduate Credit By Examination (CBE)**

See the Special Examinations in the Policies section.

**Laboratory and/or Course Fees**

Students will be assessed a laboratory or course fee if enrolled in any of the courses so designated in the Schedule of Classes (e.g., “Lab fee $50.00”).

**Late Registration Assessment**

A late registration assessment of up to $45 will be assessed for anyone registering later than two weeks (one week for a half term) after the first day of classes. It should be noted that students are not ordinarily permitted to register after the first two weeks of a full term, the first week of a half term or mini-term, or after the second class meeting of a less than one-month mini-term.

In exceptional cases, a student might be permitted to enroll even after the first two weeks (and be charged a late fee) if the student has obtained the written approval of the dean (or a designated representative) of the college or school. Late registrants not pursuing a degree (PDS/PEs) must have the approval of both the Office of Academic Support and Outreach Services and the Registrar, as well as the approval of any instructors involved.

**Fees Included Within Tuition**

The tuition and fees assessed by the University include a nominal charge for parking and other transportation-related services, information technology services, the health referral service to the Henry Ford Hospital-Fairlane Clinic, facilities debt service, and support for student activities and organizations.

**Exemption From Payment Of Fees**

No exemption from the payment of fees shall be granted. Failure to fulfill financial obligations to the University may result in disciplinary action, including the withholding of degrees and transcripts.

**New Student Fee**

The New Student Fee of $75.00 is charged to all new incoming degree-seeking students at the time of registration. The fee will be automatically posted to the student’s account. This fee covers operational expenses required to deliver high-quality orientation programming for students. It also includes the administration of placement exams, regardless of participation in these activities. The New Student Fee is non-refundable unless a student withdraws from all courses in his/her first term on or before the end of the drop/add period (the first two weeks of the term).

**Tuition and Fees**

Students should obtain current tuition and fee information from the Office of Registration & Records Tuition & Fees webpage, umdearborn.edu/rr_tuition-fees (http://www.umdearborn.edu/rr_tuition-fees/).

**Additional Assessments**

Course levels 300 and above are assessed an additional amount per credit hour. For current tuition and fee information, students should consult the Office of Registration & Records Tuition & Fees webpage, umdearborn.edu/rr_tuition-fees (http://www.umdearborn.edu/rr_tuition-fees/).

**Technology Assessment**

A Technology Assessment is charged to all students. This assessment varies by academic unit. For current tuition and fee information, students should consult the Office of Registration & Records Tuition & Fees webpages.
Special Tuition and Fee Adjustments

The Registrar and the Provost for Academic Affairs are authorized to make adjustments in the application of the policy stated above when, in their judgment, unusual circumstances warrant such action. Circumstances that may warrant special consideration include the death or serious illness of the student. The student who wishes to have his/her case reviewed must petition and submit documentation to the Office of the Registrar, Room 1169, University Center, either in person or by mail. It is the responsibility of the student to make sure that required documents are submitted.

Except in rare and unusual circumstances, petitions will not be accepted after the last day of classes for the term concerned. Additionally, petitions will not be accepted once an account has been turned over for collection.

University of Michigan Guidelines for Qualifying for In-State Tuition

You may qualify for in-state tuition in any of the following three ways:

1. Residence. By demonstrating that you are a permanent legal resident of the State of Michigan as defined by these Guidelines (see Part I below);
2. Attendance. By demonstrating that you attended an accredited Michigan high school and accredited Michigan middle or junior high school (see Part II below); OR
3. Service. By demonstrating that you or a family member are serving or have served in the U.S. military or Public Health Service (see Part III below).

You may meet the criteria under more than one Part of these Guidelines. However, if you meet the criteria under one of the three Parts, you are not required to determine eligibility under the other two.

I. Establishing Eligibility Through Michigan Residence

You may qualify for in-state tuition by demonstrating that you are a Michigan resident.

A. General Principles

The University of Michigan has autonomous, constitutional authority to establish residency guidelines that apply to the University. The University’s residency guidelines are independent of other state rules or regulations governing residency for other purposes, including income and property tax liability or eligibility to vote or drive.

To qualify for in-state tuition at the University of Michigan on the basis of being a Michigan resident, you must establish that Michigan is your permanent legal residence. In other words, you must establish that the State of Michigan is your home and that you intend to remain in the State permanently. This will depend, among other things, where you live, work, and attend school; where you have lived, worked, and attended school; where your parents or guardians live; and other evidence that you intend to make Michigan your permanent home.

The Board of Regents of the University of Michigan has charged the Residency Classification Office in the Office of the Registrar on the Ann Arbor campus with determining the residency of current and prospective students for all three University of Michigan campuses. If you are seeking in-state tuition on the basis of residence in the State of Michigan and your application, activities, and circumstances demonstrate that Michigan is your permanent legal residence, you will be classified as a resident. If, however, you seek in-state tuition on the basis of residence but your presence in the State is based on activities or circumstances that are determined to be temporary or indeterminate, you will be classified as a nonresident.

B. Process for Establishing Residency

1. Who Must Submit an Application for Resident Classification?

If you seek to qualify for in-state tuition as a Michigan resident and your application, circumstances, or activities suggest that you may have out-of-state activities or ties (as described below), you will be required to apply to be evaluated and classified as a resident or nonresident. This means completing an Application for Resident Classification truthfully and timely and submitting additional documentation.

Specifically, you must file an Application for Resident Classification if you seek in-state tuition on the basis of Michigan residence and have any of the following out-of-state activities or ties:

- You live outside the State of Michigan for any purpose, including, but not limited to, education, volunteer activities, travel, or employment; you attended or graduated from a college outside the State of Michigan; you lived or worked outside the State of Michigan at any time within the last three years; you are not a U.S. citizen; your spouse, partner, or parent is in Michigan as a nonresident student, medical resident, fellow or for military assignment or other temporary employment; you are 24 years of age or younger and a parent lives outside the State of Michigan; you are 24 years of age or younger and attended or graduated from a high school outside the state of Michigan; you attended or graduated from an out-of-state high school and have been involved in educational pursuits for the majority of time since high school graduation; you attended any University of Michigan campus (Ann Arbor, Dearborn, or Flint) as a nonresident.

How Will Your Application for Resident Classification Be Evaluated?

If you are required to file an Application for Resident Classification, the University’s Residency Classification Office will evaluate the information you provide to determine whether you have presented clear and convincing evidence demonstrating that Michigan is your permanent legal residence. The next sections of these Guidelines are designed to explain in greater detail the standards the Residency Classification Office will apply as your Application for Resident Classification is considered.

a. Circumstances that may demonstrate permanent Michigan residence

The following circumstances and activities, though not conclusive or exhaustive, may lend support to a claim that Michigan is your permanent legal residence:

- Both of your parents or parents-in-law (or in the case of divorce, one parent or parent-in-law) are permanent legal residents of Michigan as demonstrated by permanent employment in the State, establishment of a primary household in Michigan, and severance of out-of-state ties. You must also show that you have severed all out-of-state ties that suggest another state is your legal residence. You are employed in Michigan in a full-time, permanent position, your employment is the primary purpose for your or your family’s presence in the State, and you have severed any out-of-state ties that suggest...
another state is your legal residence. Your spouse or partner is employed in Michigan in a full-time, permanent position, your spouse or partner's employment is the primary purpose for your family's presence in the State, and you have severed all out-of-state ties that suggest another state is your legal residence. (C) You are enrolled in a high school, community college, or university in Michigan; (C) You are in a medical residency program, fellowship, or internship in Michigan; (C) Your employment in Michigan is temporary or short-term or of the type usually considered an internship or apprenticeship; (C) Your spouse or partner's employment in Michigan is temporary or of the type usually considered an internship or apprenticeship; (C) Your spouse or partner's employment in Michigan is permanent but you are in the State for temporary reasons; (C) Your employment position in Michigan is normally held by a student; (C) You have paid Michigan income tax or filed Michigan resident income tax returns; (C) Your relatives (other than parents) live in Michigan; (C) You own property or pay Michigan property taxes; (C) You possess a Michigan driver's license or voter's registration; you possess a Permanent Resident Alien visa; you have continuous physical presence in Michigan for one year or more, you sign a statement of intent to be domiciled in Michigan. If you are a dependent student, and both your parents are legal residents of another state, you are presumed to be a nonresident. If you are a dependent, your parents or parents-in-law are divorced, and at least one parent or parent-in-law is a permanent legal resident of the State of Michigan (as defined in these Guidelines), you are presumed to be a resident if you can demonstrate that (a) Michigan is your permanent legal residence and (b) you have severed all out-of-state ties. If you are a student living in Michigan with your parents and a permanent legal resident of this State as defined by these Guidelines, you are presumed to retain resident status eligibility even if your parents leave the State if all of the following are true: (1) you have completed at least your junior year of high school before your parents' departure; (2) you remain in Michigan, enrolled full-time in high school or an institution of higher education; and (3) you have not taken steps to establish a legal residence outside Michigan or any other action inconsistent with maintaining a permanent legal residence in Michigan. (C)

**ABSENCE FOR ACTIVE DUTY MILITARY SERVICE** (U.S. ARMY, NAVY, AIR FORCE, MARINES, COAST GUARD, MERCHANT MARINE, OFFICERS IN THE PUBLIC HEALTH SERVICE), NON-ADMINISTRATIVE MISSIONARY WORK, PEACE CORPS, AMERICORPS, OR SIMILAR PHILANTHROPIC WORK

If you are a permanent legal resident of Michigan as defined by these Guidelines when you enter active military duty, missionary work, Peace Corps, or similar service, you are presumed to retain your eligibility for resident classification if you (1) are on continuous active duty or in continuous service and (2) continuously claim Michigan as your state of legal residence for income tax purposes. If you are a dependent child of such an individual, you are presumed to be eligible for resident classification if both of the following are true: (1) you are coming to the University of Michigan directly from high school or have been continuously enrolled in college since graduating from high school; and (2) you have not claimed residency for tuition purposes elsewhere.

**2. ABSENCE BECAUSE OF TEMPORARY FOREIGN ASSIGNMENT**

If you are a dependent student and you and your parents are permanent legal residents of Michigan immediately preceding an absence for a temporary foreign assignment with a parent's Michigan employer, you may retain your eligibility for resident classification if both of the following are true: (1) your family members hold temporary visas in the foreign country, and (2) you return directly to Michigan and remain in the State for educational purposes after leaving the foreign country.

**3. TEMPORARY ABSENCE OF LESS THAN ONE YEAR**

If you are independently a permanent legal resident of Michigan immediately preceding a temporary absence of less than one year, you are presumed to retain eligibility for resident classification provided that, immediately upon your return to Michigan, you sever any out-of-state ties that suggest another state is your legal residence.

- **What Documents Must You Submit With Your Application For Resident Classification?**

  Along with your completed Application for Resident Classification form, you must submit additional documents.

  a. **All Applicants.** All applicants must submit the following additional documents with an Application for Resident Classification:

  - Copies of your driver’s license and the license(s) of the person or persons upon whom you are basing your claim to resident eligibility;
  - Copies of the front and signature pages of the most recent year’s federal and state income tax returns and W2 forms for you and the person or persons upon whom you are basing your claim to resident eligibility;
  - Any other documentation that supports your claim to resident eligibility;
  - Copies of the front and signature pages of your parents’ most recent year’s federal and state income tax returns, along with accompanying W2s (and Schedule C and E if self employed) along with your parents’ most recent pay stubs showing Michigan income taxes being withheld.
  - A signed letter from the employer, written on letterhead (including phone number), stating the position, status, and dates of employment;
  - A copy of the most recent pay stub showing that Michigan taxes are being withheld.

- **Will You Be Required To Submit Additional Documentation?**

  In addition to the documentation required above, the Residency Classification Office may request additional documentation after the initial review of your application.

- **What Happens To Materials Submitted With An Application For Resident Classification?**

  Applications and accompanying documentation will be retained by the University of Michigan in accordance with its policies and procedures. All information will be kept confidential to the extent permitted by law.

- **What Information Does the Residency Classification Office Consider?**

  In making residency determinations, the University considers all information provided with your Application for Resident Classification and any other available information it determines to be relevant.

- **How Do You File An Application for Resident Classification?**

  Before filing an Application for Resident Classification, you must read Part VI below. The Application for In-State Tuition is available online at the link at the bottom of this page under the Applications for In-State Tuition section. Please read the instructions carefully before submitting your application.

**II. Establishing Eligibility by Attending Michigan Schools**

You also may qualify for in-state tuition by demonstrating all of the following: (1) you attended an accredited Michigan high school for...
at least three years and thereafter (a) graduated from an accredited
Michigan High School or (b) received a Michigan General Educational
Development High School Equivalency Certificate (GED); (2) you attended
an accredited Michigan middle or junior high school for the two years
preceding high school; and (3) you are commencing your education at
the University within twenty-eight months of graduating from the Michigan
high school or receiving your GED.

To establish eligibility by demonstrating attendance at Michigan schools,
you must complete the following form truthfully and timely: Application
for In-State Tuition on the Basis of Attendance. You do not need to be a
legal resident of the State of Michigan or United States to qualify under
Part II.

III. Establishing Eligibility Through Service
You also may qualify for in-state tuition, without regard to your legal
residence, by demonstrating any of the following:
1. you are serving on active duty in the U.S. Army, Navy, Air Force,
   Marines, National Guard, Merchant Marine, or Coast Guard;
2. you are a reservist in one of those branches;
3. you were honorably discharged or received a general discharge under
   honorable conditions from one of those branches or their reserve
   component;
4. you are serving as an officer in the U.S. Public Health Service;
5. you are the spouse or dependent child of someone living or stationed
   in Michigan who is serving in the U.S. Army, Navy, Air Force, Marines,
   National Guard, Merchant Marine, or Coast Guard, whether on active
duty or as a reservist; OR
6. you are the spouse or dependent child of someone living or stationed
   in Michigan who is serving as an officer in the U.S. Public Health
   Service.

To establish eligibility by demonstrating service, you must complete the
following form: Application for In-State Tuition on the Basis of Service,
truthfully and timely.

IV. Deadlines
It is important to file your materials in a timely fashion. You may apply
for in-state tuition for any term in which you are enrolled or intend to
enroll. Late applications will be assessed a nonrefundable $300 late fee
and will be accepted up to the last published day of classes of the term
for which you are applying. Late applications received after the last day
of classes will be treated as applications for the following term. In all
cases, decisions will be based only on those facts that are in place by the
original filing deadline for the term under consideration.

- **Fall Term:** all required materials must be received by 5:00 p.m. on
  September 30 of that term.
- **Winter Term:** all required materials must be received by 5:00 p.m. on
  January 31 of that term.
- **Spring, Spring/Summer, and Summer Terms:** all required materials
  must be received by 5:00 p.m. on July 31 of that term.

If the deadline falls on a weekend or University holiday, all required
materials must be received by 5:00 p.m. on the next business day.

These deadlines apply to all University of Michigan schools, colleges, and
campuses. For the On-Job or On-Campus program only, filing deadlines
are 30 calendar days after the first scheduled day of classes of the term
for which you are applying.

V. Appeals
If your request for in-state tuition is denied, you may file an appeal as
described below.

The Board of Regents has charged the Appeal Committee with reviewing
decisions about eligibility for in-state tuition. The Appeal Committee is
chaired by the Vice President and Secretary of the University and includes
two other University administrators, a faculty member, and a student.
Staff of the Residency Classification Office are not members of the
Appeal Committee.

Any appeal must be in writing and must be received by the Appeal
Committee no later than 5:00 p.m. on the 30th calendar day following the
date of the letter denying your request for in-state tuition. If the deadline
falls on a weekend or University holiday, your appeal must be received by
5:00 p.m. on the next business day.

The mailing address for the Appeal Committee is as follows: Residency
Appeal Committee, c/o 1210 LS&A Bldg., 500 S. State Street, Ann Arbor,
MI 48109-1382.

If there is additional information you would like the Appeal Committee to
consider beyond the materials you have already submitted, you should
submit that additional information, in writing, with appropriate supporting
documentation, with your written appeal. The Appeal Committee may
consider the appeal letter and additional documentation along with all the
information in your original request.

Personal contact with a member of the Appeal Committee about the
subject of your appeal could disqualify him or her from participating in
the decision regarding your appeal. The Appeal Committee does not meet
in person with students, and appearances on behalf of students are not
permitted at appeal meetings.

After the Appeal Committee has completed its deliberations, you will
receive the Committee’s final decision in writing. This will conclude the
appeal process for the term covered by the application. The University
will not conduct any further review of the decision.

VI. Misrepresentations, Falsifications,
Omissions; Audits; And Adverse
Consequences
Individuals who provide false or misleading information or who omit
relevant information in an attempt wrongly to obtain in-state tuition will
be subject to severe legal and disciplinary measures, including but not
limited to expulsion from the University and retroactive tuition charges.
The University routinely audits information and documentation submitted
with requests for in-state tuition to ensure compliance.

VII. Where Can You Obtain Additional
Information?
For questions on in-state tuition, please contact:

Residency Classification Office
Office of the Registrar
1210 LSA Building
500 South State Street
Ann Arbor, MI 48109-1382
Applications for In-State Tuition

The Application for In-State Tuition is available online. Your access to the online application may depend upon your progress and status in the admissions application process, so please read carefully. In order to log in and complete an application for in-state tuition, you will need:

Your University of Michigan issued eight digit ID (UMID) number AND:

1. EITHER a University of Michigan issued uniqname and Ann Arbor/Kerberos password,
2. OR A Friend Account.²

   a. Admitted Students (All campuses) AND all applicants who have previously been issued all of the following: UM ID number, uniqname and Kerberos password, can authenticate using your uniqname and Kerberos password. NOTE: see footnote 1 if you need to reset your password.

   Application for In-State Tuition: csprod.dsc.umich.edu/services/residency (https://csprod.dsc.umich.edu/services/residency/)

   b. Applicants not yet admitted, or with no previously issued uniqname or password must apply using a verified Friend Account:

   i. Create a Friend Account: (friend.weblogin.umich.edu/friend/) (https://friend.weblogin.umich.edu/friend/)

   ii. Verify your Friend Account via Wolverine Access: wolverineaccess.umich.edu (https://wolverineaccess.umich.edu/)

   Locate the New & Prospective Student Business (N&PS) link under the Students section on the Wolverine Access homepage. After logging in with your Friend Account and password, you will be immediately prompted to complete the one-time only Identity Verification steps (add University of Michigan ID (UMID) and birthdate). Once done, you will be prompted to Sign Out; this will bring you back to the Wolverine Access homepage. Navigate back to the N&PS link, and locate the link to the online In-State Tuition Application in the lower right of the page, or, you can login later using the Application for In-State Tuition link above; this will bring you directly to the application.

² Friend Account Information:
Detailed instructions for setting up a Friend Account are provided at this link: itcs.umich.edu/friend (http://www.itcs.umich.edu/friend/)

PLEASE BE AWARE: If you originally logged in using a Friend Account and have since been admitted, your uniqname will be issued and the Friend Account log in will be disabled. You should be able to access your in-state tuition application information using your uniqname and password.

Need Help?
Please contact the ITS Service Center (4Help@umich.edu or 734-764-4357) if you encounter any login issues.

If you wish to check the status of an already submitted application, please do so through your Wolverine Access account: Students–Student Business–Residency.

Verification of Enrollment

Enrollment Verification requests cannot be processed prior to the end of the Change of Election (add/drop) period for the term requested.

When a loan agency, student loan provider, employer, insurance agency, etc. requires proof that a student enrolled at the University of Michigan-Dearborn, the Office of the registrar, at the student’s request, can provide an Enrollment Verification.

Loan Deferments

The University of Michigan-Dearborn uses the National Student Clearinghouse as the service for verifying enrollment for student loans. These verification requests will be processed by that agency within 10 business days of receipt of the request at the Office of the Registrar. Enrollment Verification request forms are available at the Office of the Registrar, 1169 University Center, during regularly scheduled office hours or via this website. When requesting verification for a student loan, you must submit the official forms sent to you by the loan agency along with your request to the Office of the Registrar.

All Other Requests

The Office of the Registrar processes requests for verification, excluding student loan deferments. Requests are accepted via mail, fax, or UM-Dearborn Connect (online). Using the online Enrollment Verification Request Form requires a Personal Identification Number (PIN). Your PIN is used as an electronic signature, allowing us to release the information that you are requesting. For your security, you should keep your PIN confidential. If you do not have a PIN or have forgotten it, please mail or fax the Printable Enrollment Verification Request Form. If you are requesting enrollment verification on a document that you have received, use the Printable Enrollment Verification Request Form, complete it, and mail or fax it along with the document to the Office of the Registrar.

Scale

The following scale is used when verifying student enrollment status at UM-Dearborn:

<table>
<thead>
<tr>
<th>Status</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time</td>
<td>12 or more hours</td>
<td>8 or more hours</td>
</tr>
<tr>
<td>Three-Quarter Time</td>
<td>9-11 hours</td>
<td>6-7 hours</td>
</tr>
<tr>
<td>Half Time</td>
<td>6 to 8 hours</td>
<td>4-5 hours</td>
</tr>
<tr>
<td>Less Than Half Time</td>
<td>5 or less hours</td>
<td>3 hours or less</td>
</tr>
</tbody>
</table>

¹ Ann Arbor/Kerberos Password:
For Flint and Dearborn students, this is NOT the password used to login to your campus’ Banner student information system (SIS). This is unique to the Ann Arbor campus. If you have been admitted and have a uniqname but are unable to log in to create an application, you might need to re-set your Ann Arbor/Kerberos password. Password assistance is different for each campus:

- Dearborn campus students click here (https://umdearborn.edu/offices/information-technology-services/accounts-passwords/) for help and instructions for changing your password.
- Flint campus students click here (https://helpdesk.umflint.edu/customer/portal/articles/1627949-umich-password—usage-restrictions-and-how-to-change-it/) for help and instructions for changing your password.
- Ann Arbor campus students click here (http://www.itcs.umich.edu/help/faq/uniquenames.php) if you need assistance with your password.

² Verification of Enrollment
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<td>Less Than Half Time</td>
<td>5 or less hours</td>
<td>3 hours or less</td>
</tr>
</tbody>
</table>
Please forward completed Printable Enrollment Verification Request Forms to:

University of Michigan-Dearborn
Office of the Registrar
1169 UC
4901 Evergreen Road
Dearborn, MI 48128-2406

Or Fax to:

University of Michigan-Dearborn
Office of the Registrar
313-593-5697

Veteran Affairs

The goal of the Office of Veteran Affairs is to provide support to a diverse community of student veterans and enhance the experience of veterans as they move through our academic programs. We accomplish this mission by:

- Providing academic assistance and tutoring
- Coordinating access to Counseling and Disabilities Services
- Providing veteran-specific enrollment and certification services
- Maintaining a dialog with our Student Veterans of America Chapter and the Association of Women Veterans
- Retaining points of contact in Financial Aid, Cashiers/Student Accounting, and the Office of the Registrar
- Forging partnerships with business, industry, educational institutions, and government agencies.
- Scheduling veteran-specific events

The veteran's office space provides a friendly environment for our active duty military and veterans to study, relax, socialize, converse, or just gain a moment of quiet reflection. Whether you were just discharged from active duty, currently on active duty, in the National Guard or Reserves, or a spouse or dependent of a disabled veteran, we will help you with your transition and academic goals. The Office of Veteran Affairs is located in the University Center in room 2174.

Certification of Educational Benefits

The administration of veteran’s education benefits programs and enrollment certifications are handled by Veteran Affairs Certifying Officials located in the Enrollment Services Office. Our goal is to effectively assist veterans, or the dependents of veterans, with the certification process. Students who are eligible for VA educational benefits are able to apply their respective benefits toward their educational endeavors at UM-Dearborn with assistance from this office.

All students who are eligible for, and elect to receive education and training benefits while attending UM-Dearborn, may address inquiries for information to the:

Office of the Registrar
4901 Evergreen Road
1169 University Center
Dearborn, MI 48128
313-583-6500 or umd-va@umd.umich.edu.

Additional information regarding veteran services, certification, and the policies and procedures for certification of benefits can be found on our website at: umd.umich.edu/rr_va (http://www.umd.umich.edu/rr_va/). Questions regarding the eligibility of a veteran or dependent can be answered by calling the St. Louis Regional Office at 1-888-GIBILL1 (442-4551) or connecting to the Department of Veteran Affairs website at: benefits.va.gov/gibill/.

College of Arts, Sciences, and Letters

College of Arts, Sciences, and Letters History of the College

From the beginning of the Dearborn Center of the University of Michigan, as it was called at first, there was “an intent to provide a full schedule of daytime courses in Engineering, Business Administration, and the Liberal Arts and Sciences” (Report by the University’s Dean of Statewide Education, January 1957). On January 10, 1958, the Regents approved the creation of the Division of Literature, Science, and the Arts (LSA) as an official academic division. Full programs in the liberal arts began in Fall 1960; by Fall 1965 the LSA Division was the largest academic unit on the Dearborn Campus, a distinction which continues to the present.

When it became a four-year undergraduate institution in 1971, the Campus was designated the University of Michigan-Dearborn (UM-Dearborn). Two years later, the Regents approved a new set of UM-Dearborn Bylaws, in which the Department of Education became a separate division, and the LSA Division became the College of Arts, Sciences, and Letters (CASL), administered by a Dean. CASL now consists of six multidisciplinary departments: Behavioral Sciences; Language, Culture, and Communication; Literature, Philosophy, and the Arts; Mathematics and Statistics; Natural Sciences and Social Sciences.

College of Arts, Sciences, and Letters Mission Statement

The College of Arts, Sciences, and Letters inspires and equips its students, through education in the liberal arts, to be servant leaders in society at large and for the resurgence and renewal in southeast Michigan. The College fulfills its mission by providing rigorous and intellectually challenging educational experiences rich in critical thinking, collaborative and reflective learning, civic engagement, and personal interaction with high quality and dedicated faculty. The College of Arts, Sciences, and Letters promotes the value of life-long intellectual growth and development, rational and respectful discourse, living and leading in multicultural societies, striving for justice and fairness, and in gaining a global perspective.

College of Arts, Sciences, and Letters Graduate Programs

Graduate programs in the College of Arts, Sciences, and Letters engage a diverse, highly motivated, and talented student body in disciplined and sustained study for both intellectual and vocational purposes. In particular, these programs are designed to equip students with the intellectual resilience required for the complex challenges of a changing world—and for the intersecting domains of professional activity, citizenship and public policy, and life-long learning.

Building on the talents of a distinguished faculty of teacher-scholars and the resources of the region, these programs fulfill two broad liberal arts functions. They enlarge, deepen, and refine students’ knowledge and awareness. They also develop students’ analytical, critical thinking, and problem-solving skills. Most emphasize interdisciplinary perspectives.
and methods, a hallmark of the College, in the conviction that multiple perspectives yield richer analytical contexts. Most offer small classes, close interaction with faculty, and special sensitivity to issues that have regional significance. Whether specifically oriented to a particular profession or not, these programs try to accommodate the interests and needs of working adults through convenient scheduling, customized plans of study, and thoughtful advising. Partnerships with the broader community provide opportunities for the dissemination and application of knowledge, and for collaborative projects. For example, our students might develop problem-solving applications for industrial and scientific settings like those in southeastern Michigan, use the Rouge River watershed as a laboratory for environmental concerns, or work with nearby healthcare providers.

CASL offers five graduate degrees: Master of Science in Applied and Computational Mathematics, Master of Science in Criminology and Criminal Justice, Master of Science in Environmental Science, Master of Science in Psychology with Specializations in Health Psychology and Clinical Health Psychology, Master of Public Administration and Policy. Following are descriptions of each program’s mission, admission standards, and requirements. For additional information see the Graduate Programs page.

**Master’s Programs**

- Applied and Computational Mathematics (p. 847)
- Criminology and Criminal Justice (p. 848)
- Environmental Science (p. 852)
- Psychology (p. 855)
- Public Administration and Policy (p. 871)

**Administration**

Martin J. Hershock, PhD, Dean

Michael Lachance, PhD, Associate Dean

Gabriella M. Scarlatta, PhD, Associate Dean

Nada Bachir, BA, Assistant to the Dean

Susan Gedert, BA, Communications Editor and Alumni Affiliate Coordinator

Rita Gordon, MA, Administrative Director

Ellen Judge-Gonzalez, MA, Director, Student Outreach and Academic Resources (SOAR Program)

Nicole Lennon, BA, Administrative Assistant

Patricia Martin, MPA, Cooperative Program Manager

Lisa Morrow, MBA, Financial Analyst

Giannina Wilson, MA, Academic Program Manager

Morgan Yuncker, BA, Outreach Marking and Event Coordinator

**Chairs and Directors**

Francine Banner, Director, WILL Program

Merilee Benore, Director, Behavioral and Biological Sciences

Scott DeGregorio, Director, Honors Program

Ivy Forsythe-Brown, Director, African American and African Studies and Center for Ethnic and Religious Studies

Jorge Gonzalez del Pozo, Chair, Language, Culture, and Communication

Georgina Hickey, Interim Chair, Natural Sciences

Sally Howell, Director, Center for Arab American Studies

Daniel Lawson, Director, Masters of Science-Environmental Science

Michelle Leonard, Director, Psychology Graduate Program

Lisa Martin, Director, Women’s and Gender Studies

Joan Remski, Director, Applied and Computational Mathematics

Lara Rusch, Director, Urban and Regional Studies Program

Ara Sanjian, Director, Center for Armenian Studies

Donald Shelton, Director, Criminology and Criminal Justice

Jonathan Smith, Chair, Behavioral Studies

Deborah Smith-Pollard, Chair, Literature, Philosophy and the Arts

David Susko, Director, Environmental Interpretative Center

John Taylor, Director, Writing Center

Dale Thomson, Chair, Social Sciences

Jamie Wraight, Program Advisor, Liberal Studies

Jennifer Zhao, Chair, Mathematics and Statistics

**Professors Emeriti**

Akiyama, Michael, PhD, Professor Emeritus of Psychology

Anderson, Donald F., PhD, Professor Emeritus of Political Science

Axsom, Richard, PhD, Professor Emeritus of Art History

Bjorn, Lars, PhD, Professor Emeritus of Sociology

Bogin, Barry A., PhD, Professor Emeritus of Anthropology

Bond, Donald J., PhD, Professor Emeritus of Physics

Brown, James W., PhD, Professor Emeritus of Mathematics

Clark, Elaine G., PhD, Professor Emerita of History

Constant, John G., PhD, Associate Professor Emeritus of Music

Cowell, Elizabeth, PhD, Associate Professor Emerita of Economics

Dahlke, Richard M., PhD, Professor Emeritus of Mathematics and Mathematics Education

DeCamp, Mark, PhD, Associate Professor Emeritus of Chemistry

Emery, Allan, PhD, Professor Emeritus of Chemistry

Fakler, Robert, PhD, Professor Emeritus of Mathematics
Fink, John F., PhD, Professor Emeritus of Mathematics
Flax, Neil M., PhD, Associate Professor Emeritus of Comparative Literature and German
Gardner, Gerald, PhD, Professor Emeritus of Psychology
Garland, Frank, PhD, Associate Professor Emeritus of Chemistry
Gillespie, John, PhD, Professor Emeritus of Mathematics and Statistics
Grewe, Eugene, PhD, Professor Emeritus of Rhetoric and English Composition
Gruber, James, PhD, Professor Emeritus of Sociology
Heady, Judith, PhD, Associate Professor Emerita of Biology
Higgs, Elton, PhD, Professor Emeritus of English Language and Literature
House, Gloria, PhD, Professor Emerita of African and African American Studies and Humanities
Höft, Margret, PhD, Professor Emerita of Mathematics
Jacobs, Claude, PhD, Associate Professor Emeritus of Behavioral Sciences
James, David A., PhD, Professor Emeritus of Mathematics
Kamachi, Noriko, PhD, Professor Emerita of History
Klein, Bernard W., PhD, Professor Emeritus of Political Science
Kotre, John, PhD, Professor Emeritus of Psychology
Lee, Dorothy A., PhD, Professor Emerita of Comparative Literature and English
Lempert, Lora Bex, PhD, Professor Emerita of Sociology
Lyjak, Robert, PhD, Professor Emeritus of Mathematics and Computer Science
Massey, Frank J., PhD, Associate Professor Emeritus of Mathematics and Computer Science
Miles, Stephen, PhD, Associate Professor Emeritus of Mathematics and Mathematics Education
Moerman, Daniel, PhD, Professor Emeritus of Anthropology
Morash, Ronald P., PhD, Professor Emeritus of Mathematics
Mostafapour, Kazem, PhD, Associate Professor Emeritus of Biochemistry and Chemistry
Nadasen, Arunajallam, PhD, Professor Emeritus of Physics
Norman, Richard, PhD, Associate Professor Emeritus of Biology
Otto, Charlotte, PhD, Professor Emerita of Chemistry
Papazian, Dennis, PhD, Professor Emeritus of History
Papp, F.J., PhD, Professor Emeritus of Mathematics
Pearson, Sheryl S., PhD, Professor Emerita of English Literature
Pebworth, Ted-Larry, PhD, Professor Emeritus of English Language and Literature
Perlove, Shelley K., PhD, Professor Emerita of Art History
Peter, Philip H., PhD, Associate Professor Emeritus of Music
Proctor, Donald, PhD, Professor Emeritus of History
Radine, Lawrence, PhD, Professor Emeritus of Sociology
Roehl, Richard, PhD, Professor Emeritus of Economics
Rubenstein, Rheta N., PhD, Professor Emerita of Mathematics
Sayles, Edward, PhD, Professor Emeritus of Philosophy
Schaum, Melita, PhD, Professor Emerita of English Literature
Schneider, Michael J., PhD, Professor Emeritus of Biology
Simpson, Robert, PhD, Professor Emeritus of Biology and Environmental Science
Snabb, Thomas E., PhD, Associate Professor Emeritus of Mathematics and Statistics
Spinelli, Emily L., PhD, Professor Emerita of Spanish
Stern, Jeffrey, PhD, Professor Emeritus of Psychology
Summers, Claude, PhD, Professor Emeritus of English Language and Literature
Tai, Julia C., PhD, Professor Emerita of Chemistry
Tentler, Leslie W., PhD, Professor Emeritus of Chemistry
Thomson, William, PhD, Associate Professor Emeritus of Psychology
Twomey, Michael, PhD, Professor Emeritus of Economics
Verhey, Roger, PhD, Professor Emeritus of Mathematics
Woodward, Wayne, PhD, Associate Professor Emeritus of Communication

Faculty
Barak, Maya, PhD, American University, Assistant Professor of Criminology and Criminal Justice
Brainer, Amy, PhD, University of Illinois at Chicago, Assistant Professor of Women’s and Gender Studies and Sociology
Lacey, Krim, PhD, Wayne State University, Assistant Professor of African and African American Studies
Lawson, Terri, PhD, Rice University, Assistant Professor of African and African American Studies
Roddy, Juliette K., PhD, Wayne State University, Professor of Criminology and Criminal Justice

Department of Behavioral Science
Aronson, Pamela, PhD, University of Minnesota, Professor of Sociology
Banner, Francine, JD, PhD, Arizona State University, Associate Professor of Sociology
Beauchesne, Patrick, PhD, University of California Berkeley, Assistant Professor of Anthropology

Chatkoff, David, PhD, University of Southern Mississippi, Associate Professor of Psychology

Chenoweth, John, PhD, University of California Berkeley, Assistant Professor of Anthropology

Clark-Foos, Arlo, PhD, University of Georgia, Associate Professor of Psychology

Dolins, Francine, PhD, University of Stirling (Scotland), Associate Professor of Psychology

Draus, Paul, PhD, Loyola University, Professor of Sociology

Early, Kevin, PhD, University of Florida, Associate Professor of Sociology

Forsythe-Brown, Ivy, PhD, University of Maryland, Assistant Professor of Sociology

Hymes, Robert W., PhD, Michigan State University, Associate Professor of Psychology

Leonard, Michelle, PhD, Wayne State University, Assistant Professor of Psychology

Liu, ZhongXu, PhD, University of Toronto, Assistant Professor of Psychology

Loeb, Roger C., PhD, Cornell University, Professor of Psychology

McAuslan, Pamela, PhD, Wayne State University, Associate Professor of Psychology

McKenna, Brian, PhD, Michigan State University, Associate Professor of Anthropology

Patel, Nehal, JD, PhD, Northwestern University, Associate Professor of Criminal Justice and Sociology

Pecina, Susana, PhD, University of Michigan, Associate Professor of Psychology

Price, Carmel, PhD, University of Tennessee at Knoxville, Assistant Professor of Psychology

Reppond, Harmony, PhD, University of California at Santa Cruz, Assistant Professor of Psychology

Sethuraman, Nitya, PhD, University of California at San Diego, Assistant Professor of Psychology

Sheldon, Jane, PhD, University of Michigan, Professor of Psychology

Shelton, Donald, JD, PhD, University of Nevada, Associate Professor of Sociology

Sievert, Caleb, PhD, Adelphi University, Assistant Professor of Psychology

Straub, Richard O., PhD, Columbia University, Professor of Psychology

Swift, Dan J., PhD, University of New Hampshire, Associate Professor of Psychology

Waung, Marie, PhD, Ohio State University, Professor of Psychology

Wellman, Rose, PhD, University of Virginia, Assistant Professor of Anthropology

Whitehead, Brenda, PhD, University of Notre Dame, Associate Professor of Psychology

Wrobel, Nancy, PhD, Wayne State University, Professor of Psychology

**Department of Language, Culture and Communication**

Calzada-Orihuela, Sofia, PhD, University of Maryland, Lecturer IV of Spanish

Davis, Daniel, D.Phil., Oxford University, Professor of Linguistics

DeGenaro, William, PhD, University of Arizona, Professor of Composition and Rhetoric

Dika, Rifaat, PhD, Wayne State University, Lecturer IV of Arabic

Gilmore, H. James, MA, University of Iowa, Clinical Associate Professor of Communication

González del Pozo, Jorge, PhD, University of Kentucky, Professor of Spanish

Iannarino, Nicholas, PhD, University of Kentucky, Assistant Professor of Communication

Kiska, Timothy, MA, Wayne State University, Associate Professor of Communication

Lee, Jamie, PhD, University of Illinois, Associate Professor of Linguistics

Luckett, Anthony, MA, Wayne State University, Lecturer III of Film Studies

Luthra, Rashmi, PhD, University of Wisconsin-Madison, Professor of Communication

MacDonald, Michael Tyler, PhD, University of Wisconsin-Milwaukee, Assistant Professor of Composition and Rhetoric

Mannion, Jerilyn, MA, Bowling Green State University, Lecturer IV of French

Martinez-Valencia, Francis Eliana, PhD, University of Alabama, Associate Professor of Spanish

Murphy, Troy, PhD, University of Pittsburgh, Associate Professor of Communication

Petra, Samantha, MA, Bowling Green State University, Lecturer IV of Spanish

Potvin, Phillip, MFA, Bennington College, Lecturer IV of Composition and Rhetoric

Proctor, Jennifer, MFA, University of Iowa, Associate Professor of Journalism and Screen Studies

Pérez, Marissa, MA, University of Michigan, Lecturer IV of Spanish

Rodríguez-McGill, Carlos, PhD, Ohio State University, Associate Professor of Spanish

Rohan, Elizabeth, PhD, University of Illinois Urbana-Champaign, Professor of Composition and Rhetoric
Scarlatta, Gabriella M., PhD, Wayne State University, Professor of French
Vansant, Jacqueline, PhD, University of Texas-Austin, Professor of German
Willard-Traub, Margaret, PhD, University of Michigan, Associate Professor of Composition and Rhetoric

**Department of Literature, Philosophy and the Arts**

Ajaz, Imran, PhD, University of Auckland (New Zealand), Associate Professor of Philosophy
Bond, Erik, PhD, New York University, Associate Professor of English Literature
Erickson, Susan N., PhD, University of Minnesota, Professor of Art History
Finlayson, J. Caitlin, PhD, University of Toronto, Associate Professor of English Literature
Hughes, Paul, PhD, University of Illinois-Chicago, Professor of Philosophy
Jarenski, Michelle, PhD, Loyola University Chicago, Associate Professor of English Literature
Lambert, Julie, MFA, Cranbrook Academy of Art, Lecturer of Applied Art
Linker, Maureen, PhD, City University of New York, Professor of Philosophy
Ng, Diana, PhD, University of Michigan, Assistant Professor of Art History
Rottner, Nadja, PhD, Columbia University, Assistant Professor of Art History
Skrbina, David, PhD, University of Bath, Lecturer of Philosophy
Smith, Jonathan, PhD, Columbia University, William E. Stirton Professor of Professor, English Language and Literature, and Behavioral Sciences
Smith Pollard, Deborah, PhD, Michigan State University, Professor of English Literature and Humanities
Stojkovski, Velimir, PhD, Marquette University, Lecturer of Philosophy

**Department of Mathematics and Statistics**

Agarwal, Mahesh, PhD, University of Michigan, Associate Professor of Mathematics
Cengiz-Phillips, Nesrin, PhD, Western Michigan University, Associate Professor of Mathematics Education
Clifford, John H., PhD, Michigan State University, Professor of Mathematics
Dabkowski, Michael, PhD, University of Wisconsin, Associate Professor of Mathematics
Fiore, Thomas, PhD, University of Michigan, Associate Professor of Mathematics
Georgieva-Hristova, Yulia, PhD, Texas AM University, Assistant Professor of Mathematics
Jabbusch, Kelly, PhD, University of Washington, Associate Professor of Mathematics
Kim, Hyejin, PhD, University of Maryland College Park, Assistant Professor of Mathematics
Krebs, Angela, PhD, Michigan State University, Associate Professor of Mathematics Education and Mathematics
Lachance, Michael A., PhD, University of South Florida, Professor of Mathematics
Macan, Montaha, PhD, University of Manchester (England), Lecturer of Mathematics
Mikula, Margaret, Western Michigan University, Lecturer of Mathematics and Statistics
Phillips, Benjamin, PhD, Western Michigan University, Lecturer of Mathematics
Pokhrel, Keshav, PhD, University of South Florida, Assistant Professor of Statistics
Radosevich, Mark R., PhD, Brandeis University, Lecturer of Mathematics
Rathouz, Margaret, PhD, University of California-San Diego, Associate Professor of Mathematics Education
Remski, Joan, PhD, Michigan State University, Professor of Mathematics
Sharaf, Taysseer, PhD, University of South Florida, Assistant Professor of Statistics
Viswanathan, Aditya, PhD, Arizona State University, Assistant Professor of Mathematics
Wiggins, Alan, PhD, Texas AM University, Associate Professor of Mathematics
Zeytuncu, Yunus, PhD, Ohio State University, Associate Professor of Mathematics
Zhao, Jennifer, PhD, Indiana University, Professor of Mathematics

**Department of Natural Science**

Abramyan, John, PhD, University of Queensland (Australia), Assistant Professor of Biology
Al-Qaisi, Sami, PhD, University of Akron, Lecturer of Chemistry
Bandyopadhyay, Krisanu, PhD, National Chemical Lab University of Pune (India), Professor of Chemistry
Bazzi, Ali, PhD, Wayne State University, Professor of Chemistry
Bazzi, Judith, MA, Wayne State University, Lecturer of Chemistry
Benore, Marilee B., PhD, University of Delaware, Professor of Biology and Biochemistry
Bowlin, Melissa, PhD, Princeton University, Associate Professor of Biology
Clarkson, William I., PhD, University of Southampton (UK), Assistant Professor of Physics and Astronomy
Constantinides, Christos, PhD, University of Cambridge (UK), Assistant Professor of Chemistry
Danielson-Francois, Anne, PhD, University of Arizona, Associate Professor of Biology
Deng, Yiwei, PhD, Swiss Federal Institute of Technology, Associate Professor of Chemistry
Donahue, Craig J., PhD, University of Massachusetts, Associate Professor of Chemistry
Gelderloos, Orin G., PhD, Northwestern University, Professor of Biology and Environmental Studies
Hartshorn, Patricia, MS, Wayne State University, Lecturer of Natural Sciences
Heinicke, Matthew, PhD, Pennsylvania State University, Associate Professor of Biology
Hetrick, James, PhD, University of Illinois at Urbana-Champaign, Lecturer of Physics
Kamp, Ulrich, PhD, Technische University Berlin, Professor of Geography
Kondapalli, Kalyan, PhD, Wayne State University, Assistant Professor of Biology
LaCommare, Katherine S., PhD, University of Massachusetts, Lecturer of Biology
Lawson, Daniel, PhD, Michigan State University, Professor of Chemistry
Li, Xiaohua (Shannon), PhD, City University of New York, Associate Professor of Chemistry
Licata, Nicolas, PhD, University of Michigan, Assistant Professor of Physics
Marincean, Simona, PhD, Michigan State University, Associate Professor of Chemistry
Miller, Donald R., MS, University of Michigan, Lecturer of Natural Sciences
Murray, Kent, PhD, University of California-Davis, Professor of Geology
Naik, Vaman M., PhD, University of Michigan, Professor of Physics
Napieralski, Jacob, PhD, Purdue University, Professor of Geology
Nesmith, Judy M., MS, Michigan State University, Lecturer of Biology
Oelkers, Peter M., PhD, Wake Forest University, Associate Professor of Biology
Prentis, Jeffrey J., PhD, University of Michigan, Professor of Physics
Riebesell, John, PhD, University of Chicago, Associate Professor of Biology
Smith, Sheila, PhD, University of North Carolina, Associate Professor of Chemistry
Stasser, Jay P., PhD, Oregon Health and Science University, Lecturer of Chemistry and Biochemistry
Stewart, Ogie, PhD, Oakland University, Lecturer of Chemistry
Susko, David, PhD, University of Windsor, Associate Professor of Biology
Thomas, John, PhD, University of Arizona, Professor of Biology
Tiquia-Arashiro, Sonia, PhD, University of Hong Kong, Professor of Biology and Microbiology
Wang, Jin, PhD, University of Queensland (Australia), Associate Professor of Physics

Department of Social Sciences

Akers, Joshua, PhD, University of Toronto, Assistant Professor of Geography and Urban and Regional Studies
Amin, Camron M., PhD, University of Chicago, Professor of History
Anderson, R. Warren, PhD, George Mason University, Associate Professor of Economics
Bawardi, Hani, PhD, Wayne State University, Associate Professor of History
Bergeron, Suzanne, PhD, University of Notre Dame, Professor of Women's Studies and Social Sciences
Borquez, Julio, PhD, University of Michigan, Associate Professor of Political Science
Czap, Hans, PhD, University of Nebraska-Lincoln, Assistant Professor of Economics
Czap, Natalia, PhD, Moscow State University and University of Nebraska-Lincoln, Associate Professor of Economics
Dye, Keith, PhD, University of Toledo, Assistant Professor of African and African American Studies and History
Hershock, Martin, PhD, University of Michigan, Professor of History
Hickey, Georgina, PhD, University of Michigan, Professor of History
Howell, Sarah (Sally), PhD, University of Michigan, Associate Professor of History
Koumpias, Antonios, PhD, Georgia State University, Assistant Professor of Economics
Kursman, Nancy, PhD, Rice University, Lecturer IV of Political Science
Lunn, Joe, PhD, University of Wisconsin-Madison, Professor of History
Luxon, Emily, PhD, University of California College Park, Assistant Professor of Political Science
Miteza, Ilir, PhD, University of Wisconsin-Milwaukee, Professor of Economics
Moran, Gerald F., PhD, Rutgers University, Professor of History
Muller, Anna, PhD, Indiana University, Assistant Professor of History
Pennock, Pamela, PhD, Ohio State University, Professor of History
Pietykowski, Bruce, PhD, New School for Social Research, Professor of Economics
Poling, Kristin, PhD, Harvard University, Assistant Professor of History
The Applied and Computational Mathematics (ACM) program provides graduate-level education in applied mathematics for people whose goal is to develop comprehension of principles of applied mathematics and skills in employing those principles in industrial or scientific settings. It has three central themes: general principles and theories of applied mathematics, the construction and analysis of mathematical models, and the development and efficient execution of computational mathematical algorithms. Effective use of advanced applied mathematical techniques has become increasingly important in industrial settings as the amount of sophisticated simulation software has mushroomed. People are needed who can help engineers, scientists and managers in the precise formulation of complex problems and in selecting the analytical methods and software appropriate for their solution. These people should understand the algorithms underlying mathematical software and be able to implement additional mathematical algorithms knowledgeably and efficiently in the framework of existing software. Finally, these people need to be able to interpret the results of computations to others. It is the goal of the program to provide people with these skills.

The Program
The key components of this evening program involve the integration of applied mathematics, mathematical modeling and numerical analysis. The ACM program provides not only coursework in various areas of applied mathematics, but also opportunities for independent or collaborative work. These approaches to learning contribute to a student's outlook and depth of understanding. The program supports the development and enhancement of students' skills useful in industrial and scientific careers, and in other careers having applied mathematics as its primary focus. It is geared toward three groups of prospective students: individuals in established careers who want or require further training for their current positions, individuals in the workforce who wish to retrain for new career directions, in some cases preparing for a more mathematically-oriented assignment with their current employer, and recent graduates who desire a deeper understanding of applied mathematics as an aid in launching a career.

Admission and Prerequisites
Admission to the ACM program as a regular student requires a BA or a BS degree in mathematics, computer and information science, engineering, a physical science or a life science earned from a program at an accredited institution with an average of B or better. Individuals with other degrees or less than a B average may be considered for conditional admission status and may be required to submit evidence of potential for success in a graduate program. An entering student should have completed three courses in Calculus, including multivariate calculus, plus introductory courses in Linear Algebra and Differential Equations. Deficiencies in prerequisites may be made up after entrance to the Graduate Program. However, credits received in courses elected to make up the deficiencies do not count toward the degree.

Application instructions can be found at: umdearborn.edu/gradapplynow (http://www.umdearborn.edu/gradapplynow/)

Each applicant should submit the following:

1. Official transcripts from all universities attended.
2. A one-page statement of purpose describing the applicant’s career goals and personal objectives in pursuing the program.
3. Three letters of recommendation. At least one letter must be from an academic source.
4. Students whose native language is not English are also required to satisfy the English Language Requirements for Admission which can be found in the General Information section of this catalog.

For more information, visit the ACM website (https://umdearborn.edu/casl/graduate-programs/programs/master-science-applied-and-computational-mathematics/) or call 313-583-6321.

Advanced Standing
Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution as specified in the Horace H. Rackham School of Graduate Studies regulations (http://www.rackham.umich.edu/current-students/policies/academic-policies/). You may transfer up to one-half (1/2) the minimum number of credit hours required for your master's or professional degree from U-M/non-Rackham departments and programs (including Ann Arbor, Dearborn and Flint).

Degree Requirements
30 semester hours of graduate course work with a cumulative grade point average of B or better. The 30 hours must be selected from lists of approved courses and be approved by the student's graduate advisor. At least 15 of the hours must be Mathematics and Statistics courses. Up to six credit hours toward the degree may be granted by
the Graduate Program Committee to a student through the transfer of credit for approved graduate-level courses. Such courses must have been completed within the past five years with a grade of B or better at an accredited institution and not have been applied in whole or in part toward another degree or certificate. In addition to the specific degree requirements listed here, the general Master's degree requirements of the Horace H. Rackham School of Graduate Studies (http://www.rackham.umich.edu/current-students/policies/academic-policies/) apply.

Specific Course Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Select one course from each of the following areas. At most, nine credit hours of these courses may count toward the 30 credit hours.</td>
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<tr>
<td>Mathematical Analysis:</td>
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<td></td>
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<tr>
<td>MATH 551</td>
<td>Advanced Calculus I</td>
<td></td>
</tr>
<tr>
<td>MATH 554</td>
<td>Fourier and Boundary</td>
<td></td>
</tr>
<tr>
<td>MATH 555</td>
<td>Func of a Complex Var with App</td>
<td></td>
</tr>
<tr>
<td>Modeling:</td>
<td></td>
<td></td>
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<tr>
<td>MATH 562</td>
<td>Mathematical Modeling</td>
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<tr>
<td>Numerical Methods:</td>
<td></td>
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<tr>
<td>MATH 572</td>
<td>Intro to Numerical Analysis</td>
<td></td>
</tr>
<tr>
<td>or MATH 573</td>
<td>Matrix Computation</td>
<td></td>
</tr>
<tr>
<td>Modeling Specialization Areas</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Select at least four courses from the modeling specialization areas listed below. Not all four may be from the same area.</td>
<td></td>
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<tr>
<td>Linear and Discrete Models:</td>
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</tr>
<tr>
<td>MATH 515</td>
<td>B-Splines &amp; Their Applications</td>
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</tr>
<tr>
<td>MATH 523</td>
<td>Linear Algebra w/Applications</td>
<td></td>
</tr>
<tr>
<td>STAT 530</td>
<td>Applied Regression Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 558</td>
<td>Introduction to Wavelets</td>
<td></td>
</tr>
<tr>
<td>MATH 584</td>
<td>Applied&amp;Algorithmic Graph Thy</td>
<td></td>
</tr>
<tr>
<td>Differential Models:</td>
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<td></td>
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<tr>
<td>MATH 504</td>
<td>Dynamical Systems</td>
<td></td>
</tr>
<tr>
<td>MATH 514</td>
<td>Fin Diff Meth for Diff Equat</td>
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<tr>
<td>MATH 516</td>
<td>Fin Elemnt Meth for Diff Equat</td>
<td></td>
</tr>
<tr>
<td>MATH 554</td>
<td>Fourier and Boundary</td>
<td></td>
</tr>
<tr>
<td>Statistical Models:</td>
<td></td>
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</tr>
<tr>
<td>MATH 520</td>
<td>Stochastic Processes</td>
<td></td>
</tr>
<tr>
<td>MATH 525</td>
<td>Mathematical Statistics II</td>
<td></td>
</tr>
<tr>
<td>STAT 535</td>
<td>Data Analysis and Modeling</td>
<td></td>
</tr>
<tr>
<td>STAT 545</td>
<td>Reliability &amp; Survival Analys</td>
<td></td>
</tr>
<tr>
<td>STAT 530</td>
<td>Applied Regression Analysis</td>
<td></td>
</tr>
<tr>
<td>STAT 560</td>
<td>Time Series Analysis</td>
<td></td>
</tr>
<tr>
<td>Project or Independent Research</td>
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</tr>
<tr>
<td>MATH 595</td>
<td>Master's Project Seminar</td>
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<tr>
<td>or MATH 599:Independent Research Project</td>
<td></td>
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<tr>
<td>Cognate</td>
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<td>6</td>
</tr>
<tr>
<td>Six credit hours of cognate courses outside the Department of Mathematics and Statistics are required. The courses should be selected from an approved list.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Credit Hours</td>
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<td>30</td>
</tr>
</tbody>
</table>

Cognate Courses

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer and Information Science</td>
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<td></td>
</tr>
<tr>
<td>CIS 505</td>
<td>Algorithm Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 515</td>
<td>Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 527</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CIS 537</td>
<td>Advanced Netwrkng &amp; Dist Syst</td>
<td>3</td>
</tr>
<tr>
<td>CIS 544</td>
<td>Computer and Network Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 551</td>
<td>Advanced Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 552</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 568</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>CIS 574</td>
<td>Compiler Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 575</td>
<td>Software Engineering Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>CIS 652</td>
<td>Info Visualzn &amp; Comp Anim</td>
<td>3</td>
</tr>
<tr>
<td>Economics</td>
<td></td>
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<tr>
<td>ECON 5015</td>
<td>Introduction to Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
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<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 555</td>
<td>Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 565</td>
<td>Digital Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 567</td>
<td>Nonlinear Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 585</td>
<td>Pattern Recognition</td>
<td>3</td>
</tr>
<tr>
<td>ECE 665</td>
<td>Optimal Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>Industrial and Manufacturing Systems Engineering</td>
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<tr>
<td>IMSE 500</td>
<td>Models of Oper Research</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 505</td>
<td>Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 510</td>
<td>Probability &amp; Statistical Mod</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 511</td>
<td>Design and Analysis of Exp</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 514</td>
<td>Multivariate Statistics</td>
<td>3</td>
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<tr>
<td>IMSE 520</td>
<td>Managerial Decision Analysis</td>
<td>3</td>
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<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Management</td>
<td></td>
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<tr>
<td>DS 570</td>
<td>Management Science</td>
<td>3</td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>OM 660</td>
<td>Supply Chain Analytics</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td></td>
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</tr>
<tr>
<td>ME 510</td>
<td>Finite Element Methods</td>
<td>3</td>
</tr>
<tr>
<td>ME 518</td>
<td>Advanced Engineering Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 503</td>
<td>Electricity &amp; Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 553</td>
<td>Quantum Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Criminology and Criminal Justice

Advance your career with a Michigan graduate degree from University of Michigan-Dearborn in the rapidly growing criminal justice profession.
Faculty, who are experts in their field, developed the Master of Science in Criminology and Criminal Justice to prepare students for research, management and policy positions or continuation into a Ph.D. program. This flexible degree program is 30-31 credits and provides a thesis and non-thesis option, while offering traditional, evening and online courses. Public safety professionals from partnering organizations may qualify for a scholarship valued at 20 percent of tuition and fees through our community service personnel scholarship program.

**Admission Requirements**
- Completion of a Bachelor’s degree with at least a 3.0 undergraduate GPA
- Completion of the following courses or equivalent:
  - CRJ 200 Introduction to Criminal Justice
  - CRJ 468 Criminology
  - CRJ 416 Criminal Law

Applicants who meet the GPA requirement but lack one or more required courses may be admitted conditionally with the permission of the Program Director. These course deficiencies may be completed concurrently with graduate courses in the program upon Program Director approval.

**Community Service Personnel Scholarships**
The University of Michigan-Dearborn provides a scholarship valued at 20% of tuition and fees for public safety employees at partnering organizations. The scholarship is available for degree-seeking students and can be used for undergraduate and graduate programs.

**Accelerated Program: 4+1**
The 4+1 accelerated program option allows current UM-Dearborn undergraduate Criminology and Criminal Justice majors to complete both the Bachelor of Arts and the Master of Science in Criminology and Criminal Justice in a format that offers substantial savings in both time and money. This is achieved by a double-counting allowance of up to 15 credits or 5 graduate level (500-level or above) courses. One additional year of graduate work (15-16 credits) would be needed to complete the Master’s program enabling students to earn two degrees in a total of five years.

Participation in the 4+1 program is limited to students who have completed at least 60 credit hours with a cumulative GPA of 3.0 or better. Admission to the 4+1 program is at the discretion of the Program Director and requires an admission interview. The "regular" online graduate application should be completed with a "Yes" response to the 4+1 accelerated program question. The only supplemental application materials required for 4+1 applicants are a personal statement describing career goals and a resume.

Once admitted to the 4+1 program, the student must attain a grade of B- or better in each 500 level class elected. Failure to do so may result in removal from the 4+1 program.

For additional information, please see the Master of Science in Criminology and Criminal Justice website or call 313-583-6321.

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### Specific Course Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>Core Courses</strong></td>
<td></td>
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</tr>
<tr>
<td>CRJ 518</td>
<td>CJ Research Methods ¹,²</td>
<td>3</td>
</tr>
<tr>
<td>or PAPP 580</td>
<td>Stat Method for Decisionmaking</td>
<td></td>
</tr>
<tr>
<td>CRJ 553</td>
<td>Sociology of Law ¹</td>
<td>3</td>
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<tr>
<td>or CRJ 560</td>
<td>Law and Culture</td>
<td></td>
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<tr>
<td>or PAPP 505</td>
<td>Intro to Public Admin</td>
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<td>CRJ 565</td>
<td>Deviant Behavior/Soc Disorganz</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 570</td>
<td>Current Issues in Crim Justice</td>
<td>3</td>
</tr>
<tr>
<td>or CRJ 515</td>
<td>Restorative Justice</td>
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<td>CRJ 588</td>
<td>Criminal Procedure</td>
<td>3</td>
</tr>
<tr>
<td>PAPP 561</td>
<td>Organization Develop &amp; Theory ¹</td>
<td>3</td>
</tr>
<tr>
<td>or CRJ 580</td>
<td>Applied CJ Theory</td>
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**Elective Courses**
Select three courses from the following:

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CRJ 509</td>
<td>Intel and Homeland Security</td>
</tr>
<tr>
<td>CRJ 514</td>
<td>Civil Rights and Liberties</td>
</tr>
<tr>
<td>CRJ 515</td>
<td>Restorative Justice</td>
</tr>
<tr>
<td>CRJ 517</td>
<td>Crimmigration</td>
</tr>
<tr>
<td>CRJ 543</td>
<td>Gender Roles</td>
</tr>
<tr>
<td>CRJ 546</td>
<td>Marriage and Family Problems</td>
</tr>
<tr>
<td>CRJ 553</td>
<td>Sociology of Law</td>
</tr>
<tr>
<td>CRJ 560</td>
<td>Law and Culture</td>
</tr>
<tr>
<td>CRJ 566</td>
<td>Drugs, Alcohol, and Society</td>
</tr>
<tr>
<td>CRJ 569</td>
<td>Juvenile Delinquency</td>
</tr>
<tr>
<td>CRJ 570</td>
<td>Current Issues in Crim Justice</td>
</tr>
<tr>
<td>CRJ 582</td>
<td>Legal Ethics</td>
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<tr>
<td>PAPP 520</td>
<td>Govt &amp; Nonprofit Leadership</td>
</tr>
<tr>
<td>PAPP 523</td>
<td>Administrative Law</td>
</tr>
<tr>
<td>PAPP 540</td>
<td>Government &amp; Nonprofit Finance ¹</td>
</tr>
<tr>
<td>PAPP 581</td>
<td>Strategic Mgt for Pub Admin</td>
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<tr>
<td>PAPP 582</td>
<td>Policy Analysis &amp; Development</td>
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<tr>
<td>PAPP 583</td>
<td>Program Evaluation</td>
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</table>

**Master's Essay or Master's Thesis**
Select one of the following options:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRJ 599</td>
<td>CRJ Master's Essay ³</td>
<td>3</td>
</tr>
<tr>
<td>CRJ 699</td>
<td>CRJ Thesis ⁴</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours**
30-31

¹ PAPP 505, PAPP 540, PAPP 561, and PAPP 580 are required courses for the Criminal Justice Administration concentration. This concentration is appropriate for those individuals who intend to pursue career choices primarily in administrative or managerial roles.

² CRJ 518 is required for students completing the thesis option (CRJ 699).

³ The non-thesis option is for those seeking to further a career in the law enforcement or criminal justice field.

⁴ The thesis option is for those who are planning to continue their education at the Ph.D. level.
**CRJ 509 Intel and Homeland Security** 3 Credit Hours

Full Title: Intelligence and Homeland Security

This course will provide an in-depth examination of the principles that guide the collection, analysis, and sharing of intelligence in the United States and how these principles impact homeland security. Topics will include the US Intelligence Community (CIA, FBI, military intelligence), the National Criminal Intelligence Sharing Plan, the National Intelligence Strategy, and the recent emphasis places on Intelligence-Led Policing. Emphasis will also be placed on the increased role that local and state law enforcement agencies as well as private sector entities play in contributing to the assessment of threats to homeland security. (F.W.S)

**Restriction(s):**
Can enroll if Level is Graduate

**CRJ 513 American Constitutional Law** 3 Credit Hours

A major theme of this course is the development of the constitution, especially focusing on the themes of judicial review, judicial self-restraint and judicial activism; the expansion of executive and legislative powers; and the rise of "substantive due process of the law". Prerequisite or equivalent recommended. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).

**Prerequisite(s):** POL 101

**Restriction(s):**
Can enroll if Class is Graduate

**CRJ 514 Civil Rights and Liberties** 3 Credit Hours

An analysis of the Bill of Rights and the 14th Amendment, with particular emphasis upon recent landmark or controversial Supreme Court decisions dealing with freedom of speech and religion, rights of criminal defendants; cruel and unusual punishment, right to privacy; civil rights and equal protection clause; and apportionment. Prerequisite or equivalent recommended. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (AY).

**Prerequisite(s):** POL 101

**Restriction(s):**
Can enroll if Class is Graduate

**CRJ 515 Restorative Justice** 3 Credit Hours

This graduate course explores the practice of restorative justice as it has been engaged in historical and contemporary criminal justice contexts. Topics addressed include the principles and philosophies underlying restorative justice, differences between restorative and restorative models, victim-offender dialogue, and offender reintegration. Students will be asked to think critically about restorative and retributive systems and to apply these concepts to develop their own approach to restorative justice.

**CRJ 517 Crimmigration** 3 Credit Hours

Full Title: Crimmigration: Intersections of Immigration and Criminal Justice

This course explores the intersection(s) of the criminal justice and immigration systems with special attention to race, class, and gender. It covers the evolution of American immigration policy and its application, the criminalization of immigrants, immigrant offending and victimization, the policing of immigrant communities, and the immigrant experience in the United States.

**Prerequisite(s):** CRJ 200 or CRJ 468 or CRJ 473 or SOC 200 or SOC 201

**CRJ 518 CJ Research Methods** 4 Credit Hours

Full Title: Criminal Justice Research Methods

This course provides an introduction to methods of data collection and analysis, as well as a discussion of research design and the philosophy of social science, within the context of the field of Criminology and Criminal Justice. Attention is given to quantitative, qualitative, and mixed methodologies.

**Restriction(s):**
Can enroll if Class is Graduate
CRJ 560  Law and Culture  3 Credit Hours
This course will explore the ways in which legal rules, norms, and processes are embedded in and shaped by the societies in which they are created and disseminated. We will address anthropological and sociological theories about the nature of law and disputes, examine related studies of legal structures in non-Western cultures, and consider the uses of sociology and anthropology in studying our own legal system. By examining individual legal institutions in the context of their particular cultural settings, we can begin to make cross-cultural comparisons and contrasts. In so doing, we confront the challenge of interpreting and understanding the legal rules and institutions of other cultures while assessing the impact of our own social norms and biases. (F,W)
Restriction(s):
Can enroll if Level is Graduate

CRJ 565  Deviant Behavior/Soc Disorganz  3 Credit Hours
General analysis of the concepts of social deviance and social disorganizations: factors producing each condition, the effects of social control measures on the course of deviance and disorganization consequences for the social system, and the relationship between the two concepts. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR)
Prerequisite(s):
SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 566  Drugs, Alcohol, and Society  3 Credit Hours
Analyses of the sociology of substance use and abuse. Provide a sociological framework for understanding issues and evaluating our nation's responses to the phenomenon of drug use. Drawing on sociocultural and social psychological perspectives, this course systematically examines the social structure, social problems, and social policy aspects of drugs in American Society. Additional assignments will distinguish this course from its undergraduate version.
Prerequisite(s):
SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 568  Criminology  3 Credit Hours
Analysis of criminal behavior in relationship to the institutional framework of society. Emphasis upon the more routinized and persistent forms of criminality along with the joint roles played by victims, the criminal, the police, and all other relevant parties. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR)
Prerequisite(s):
SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 569  Juvenile Delinquency  3 Credit Hours
The analysis of juvenile delinquent behavior in relationship to the institutional framework of society. Emphasis on the extent, causes, and methods of treatment of juvenile delinquency in the United States. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR)
Prerequisite(s):
SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 570  Current Issues in Crim Justice  3 Credit Hours
Current issues in the field of criminal justice and law enforcement in the US and other countries. Topics include an evaluation of police activities, problems of apprehensions and prosecution, the courts and the correctional system, and the efficacy of the legal structure in its social context. Prerequisite or permission of instructor. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s):
CRJ 200
Restriction(s):
Can enroll if Class is Graduate

CRJ 571  Int'l Criminal Justice Systems  3 Credit Hours
Description, analysis, and evaluation of selected criminal justice systems throughout the world. Course focuses on the various systems, theories, structures, methods, and functions, including common law systems and socialist law systems. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (YR).
Prerequisite(s):
SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

CRJ 572  Correctional Systems  3 Credit Hours
Analysis of the legal, social and political issues affecting contemporary correctional theory and practice. Topics covered include the history of corrections, the nature of existing institutions; the functions and social structure of correctional institutions; and alternatives to institutional incarceration; probation and parole. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research. (OC).
Restriction(s):
Can enroll if Class is Graduate

CRJ 570  Applied CJ Theory  3 Credit Hours
Full Course Title: Applied Criminal Justice Theory Criminal Justice theories emphasize the study of formal and informal mechanisms of social control in specific places, such as bars and night clubs, city parks, schools, and shopping malls. This course will include a comprehensive assessment of Criminal Justice theories as well as key principles of human behavior that may be impacted by formal or informal mechanisms of social control. As an applied theory course, students will also be introduced to a process by which theories and principles can be translated into daily practical use in place where behavioral problems frequently occur. (YR)
Prerequisite(s):
CRJ 200 and CRJ 468 and CRJ 473 and SOC 200 or SOC 201

CRJ 582  Legal Ethics  3 Credit Hours
This course will explore the many ethical dilemmas faced by professionals in the legal system. We will pay particular attention to the criminal justice system and to the Rules of Professional Conduct for attorneys. Some of the questions we may address are: How should an attorney consider his/her own ethical beliefs when deciding the appropriate course of action in a case? How should a judge consider his/ her own ethical beliefs when making a juvenile justice decision? How should a police officer determine the ethical course of action when the law's instructions are ambiguous? (FW)
Restriction(s):
Can enroll if Level is Graduate
CRJ 584  White Collar Crime  3 Credit Hours
This course reviews the history, categories, and problems related to white-collar crime. The course covers these topics by incorporating both legal and empirical perspectives in the study of white collar crime. In this course, we will focus on the substantive and procedural white collar crime laws ('law on the books') and analyze real white collar crime cases. Simultaneously, we will pay special attention to the dynamic relationship between white color crime and the American regulatory framework. As a result, we will assess the relationship and differences between various types of white collar crime and the regulatory regimes that oversee the business sector ('law in action'). (OC)

CRJ 588  Criminal Procedure  3 Credit Hours
Full Title: Criminal Procedure and Constitutional Law This class is a study of Constitutional law regarding criminal procedure in the United States. Initially the class reviews the federal and state court structure relating to criminal prosecutions and the flow of cases through those systems. The focus is then on the nature of individual rights under the Constitution, the case law, and the concept of the "exclusionary rule." The class then examines specific issues and procedures relating to arrests, searches, confessions and identifications, and analyzes the constitutional requirements for each. (F,W,S)

Restriction(s):
Can enroll if Level is Graduate

CRJ 590  Topics in Criminal Justice  3 Credit Hours
Examination of problems and issues in selected areas of criminal justice. Title as listed in Schedule of Classes will change according to the content of the course. Course may be repeated for credit when specific topics differ. This course is distinguished from its 400 level counterpart by the requirement of additional readings and research.

Restriction(s):
Can enroll if Class is Graduate

CRJ 598  Directed Studies  1 to 6 Credit Hours
Directed individual study of any subject agreed upon by the student and the instructor. May not duplicate a formal course offering. (F, S, W).

CRJ 599  CRJ Master's Essay  3 Credit Hours
Full Title: Criminology & Criminal Justice Essay Criminology and Criminal Justice Master's degree non-thesis students must complete a major essay addressing the application of substantive or theoretical issues in criminology or criminal justice to current issues or practices in the field. The major paper may be based on papers completed in other graduate courses but must be of higher quality and depth than a usual term paper. The topic must be approved in advance, and approved upon completion, by the graduate faculty advisor.

Restriction(s):
Can enroll if Level is Graduate
Can enroll if Major is Criminal Justice Studies, Criminology & Criminal Justice

Environmental Science
The Master of Science in Environmental Science (MSES) is a two-year program designed for students who wish to pursue graduate study on a full or part-time basis so they can balance professional and personal goals. Courses are primarily held in the evening and occasionally on Saturdays. Graduate students in the Department of Natural Sciences are talented and often have significant professional experience. Graduate faculty are highly qualified and experienced, and the educational culture is one in which learning, teaching, and research are emphasized. Pursuing a graduate degree in Environmental Science at UM-Dearborn will result in substantial growth in knowledge, skills, and long-term career potential.

We stress personalized, individual attention to graduate student education and research. The program provides a choice between emphasizing the environmental aspects of biology, chemistry, or geology, or a more broadly focused approach involving courses in each of the above fields. Faculty and students are engaged in the research of environmental issues including: wetlands delineation; the treatment of nitrate contaminated groundwater with microbiological techniques; the impact of land use on groundwater and surface water quality; the use of phyto remediation in the cleanup of polycyclic aromatic hydrocarbon contaminated soil; brownfield investigation and restoration; migration behavior and ecology of birds, and behavioral ecology of spiders and other arthropods; microbial source tracking; the use of microorganisms in biofuel synthesis; and microbial community dynamics and diversity in marine and freshwater sediments.

Research Facilities
The Department of Natural Sciences has extensive networked computing facilities, including scanners, digitizers and plotters, GIS and groundwater modeling software, GPS equipment, ICP-MS and labs for preparation and chemical analysis of environmental, biological and geological samples. We also have extensive mineralogic and paleontologic collections as well as the Merritt Geode Collections, one of the finest in the world. A focal point for the environmental program on the Dearborn campus is the Environmental Interpretive Center that opened in May, 2001. Rouge River Bird Observatory (RRBO) studies the importance of urban areas to birds, especially migratory birds. We are the longest-running, full-time urban bird research station in North America.

Admission and Prerequisites
Regular admission to the MSES program is extended to students with a Bachelor's Degree in environmental science biology, chemistry and geology from an accredited program who have completed all program
prerequisites and a cumulative undergraduate GPA 3.1 or higher (based on a 4.0 scale). The Graduate Record Exam (GRE) is not required if these conditions have been met. Conditional admission to the MSES program is extended to students with an undergraduate degree in some other field if they meet other criteria (completed the GRE, have written a convincing letter explaining their commitment to the degree and have obtained strong letters of recommendation) and can complete program prerequisites within one year of acceptance. Minimum program prerequisites include one year of general chemistry and one upper division course in chemistry – typically quantitative methods analysis or organic chemistry; introductory courses in biology and geology, a field course in either biology or geology; one year (two semesters) of calculus, a one-semester course in organic chemistry and a course in statistics. Deficiencies may be satisfied by completing prerequisite courses at UM-Dearborn or at another school with the approval of the graduate program committee.

Each applicant should submit the following:

1. Official transcripts from all universities attended.
2. A one-page statement of purpose describing the applicant’s career goals and personal objectives in pursuing the program.
3. Three letters of recommendation.
4. Students whose native language is not English are also required to satisfy the English Language Requirements for Admission. Details can be found in the Graduate Admissions (p. 809) section.

Application instructions can be found at: umdearborn.edu/gradapplynow

For more information, visit the MSES website or call 313-583-6321.

Degree Requirements

The MSES degree requires 30 semester hours of graduate coursework that can be satisfied by one of three options:

- **Plan A. Thesis Option** 24 credit hours (500 level or above) plus ESCI 699. A thesis will be based on original research. (Preferred by the environmental consulting industry)
- **Plan B. Project Option** 27 credit hours (500 level or above) plus ESCI 698. A project will be based on library/field/laboratory research or classroom exercises demonstrating analysis and interpretation of scientific data.
- **Plan C. Coursework Option** 30 credit hours (500 level or above) (Not recommended for students interested in doctoral degrees).

The non-thesis M.S. program has an emphasis on coursework, while the thesis-based/project-based degree has an emphasis on both coursework and original research. Thesis-based M.S. students will experience the excitement of performing guided research.

A cumulative grade point average of B or better is required. For more information, visit the MSES website.

### Specific Course Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>Core Courses</strong></td>
<td></td>
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<tr>
<td>BIOL 508</td>
<td>Invasive Species Ecology</td>
<td>3</td>
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<tr>
<td>or BIOL 514</td>
<td>Applied Ecology</td>
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<td>CHEM 548</td>
<td>Environmental Chemistry</td>
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<tr>
<td>ESCI 572</td>
<td>Environmental Communications</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 574</td>
<td>Watershed Analysis</td>
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<tr>
<td>GEOL 550</td>
<td>Glacial Geology</td>
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### Electives

Select fifteen credit hours from:

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<th>Department of Natural Sciences:</th>
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<tr>
<td>BIOL 508</td>
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<td>STAT 545</td>
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<td>STAT 555</td>
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</table>

| Total Credit Hours | 30 |

### Three Options for a MSES Degree

- **Plan A. Thesis Option** 24 credit hours (500 or above level) plus 6 credits ESCI 699. A thesis will be based on original research. (Preferred by the environmental consulting industry.)
- **Plan B. Project Option** 27 credit hours (500 level or above) plus ESCI 698. A project will be based on library/field/laboratory research or classroom exercises demonstrating analysis and interpretation of scientific data.
ESCI 504 Field Studies in Env Science 2 Credit Hours
A systematic analysis of the environment. This course will focus on the analysis of the Rouge River Watershed as an ecological unit. The student will make intensive analyses of the river water and the surrounding land surface at selected sites. The results will provide a composite of the water quality and land use of the various tributaries. Emphasis will be placed on proper sampling and testing techniques, field and lab safety procedures, aquatic chemistry, biological organisms as indicators of pollution, and the role of wastewater dumping on the watershed.

ESCI 525 Soil in the Environment 3 Credit Hours
The study of soil in the environment, including its formation, classification, physical attributes and engineering properties with an emphasis on soil-water statics and dynamics, chemical attributes and processes. Students are expected to have background knowledge of physical geology. The course will include field trips and field work, including the collection of soil samples from the Universities natural area. The course will also include a laboratory component in which students will perform a variety of test, e.g. bulk density, engineering properties on the soil samples collected. the course will typically be team taught. (S, AY)
Prerequisite(s): GEOL 118
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if College is Education, Health, and Human Services or Business or Engineering and Computer Science or Arts, Sciences, and Letters

ESCI 572 Environmental Communications 3 Credit Hours
Preparation and presentation of both oral and written technical abstracts and reports, including environmental newsletters, thesis, and media releases. Professional scientists must be able to effectively communicate ideas and concepts to other scientists and to the general public. This course will provide the foundations in learning how to communicate ideas effectively and succinctly. (F, YR)
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if College is Arts, Sciences, and Letters

ESCI 574 Watershed Analysis 3 Credit Hours
An interdisciplinary study of watersheds, the most commonly used bioregional unit. The course integrates the analysis of many factors which contribute to the character of watersheds, including bedrock and surficial geology, surface and groundwater hydrology, social history, land use history, water quality analysis, biological diversity, laws and regulations, management models, drinking water and wastewater systems, best management practices, and educational programs. The Rouge River watershed will serve as the primary case study.
Restriction(s):
Can enroll if Class is Graduate

ESCI 585 Spatial Analysis and GIS 3 Credit Hours
Application of the principles of Spatial Analysis and the use of Geographic Information Systems as a research tool in Environmental Science. Emphasis will be placed on the use of commercially available software including: ESRI's ArcView GIS, Golden Software's Surfer and Adobe PhotoShop. Emphasis will also be placed on the use of the Michigan spatial data warehouse program and the Michigan geographic framework program for metadata specific to Michigan. (AY).
Restriction(s):
Can enroll if Class is Graduate

ESCI 595 Topics in Environmental Science 3 Credit Hours
Problems or readings on specific topics or subjects in environmental science. (YR)
Restriction(s):
Can enroll if Class is Senior or Graduate
Can enroll if College is Arts, Sciences, and Letters

ESCI 595G Topics in Environmental Science 3 Credit Hours
Topic: Soil in the Environment. A study of the textural and chemical classification of soil as well as the biologic, engineering and geologic aspects of soil science including applications to agriculture and agronomic science. The course will explore topics such as soil formation, soil-water statics and dynamics, soil-energy balances, soil fertility and plant nutrition, biodiversity, soil and water management, soil pollution and remediation.

ESCI 597 Off-Campus Independent Study 1 to 3 Credit Hours
Provides opportunity for qualified graduate students in the MSES program to pursue independent research under the direction of a graduate faculty member off campus. A written proposal describing the project (including the nature of the project itself, dates, where the project will be done and the faculty member supervising the project) must be approved by the MSES program director/committee before the student can register for the course. Project must be appropriate to the student's chosen track. It must be designed to produce a scholarly paper, papers, or other evidence(s) that reflect significant results from the course (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ESCI 599 On-Campus Independent Study 1 to 3 Credit Hours
Provides opportunity for qualified graduate students in the MSES program to pursue independent research under the direction of a graduate faculty member. A written proposal describing the project (including the nature of the project itself, dates, and the supervising faculty member) must be submitted to the Program Director/committee for approval before the student can register for the course. Project must be appropriate to the student's chosen track. It must be designed to produce a scholarly paper, papers, or other evidence(s) that reflect significant results from the course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ESCI 698 MSES Master's Project 3 Credit Hours
Intended for students who present a plan for a project using methods of intellectual exploration and analysis. Possible projects include gathering data through laboratory or field based studies, using interviews and survey instruments to gauge human responses. They should involve creative representations, writing, and other forms of interdisciplinary analysis. To be carried out under the general supervision of a member of the graduate faculty in Natural Sciences. Project plan must be approved by the MSES Program Director/committee before student registers for this course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate

ESCI 699 MSES Master's Thesis 1 to 6 Credit Hours
MSES students electing this thesis option in the last stage of the program will work under the general supervision of a member of the graduate faculty in Natural Sciences, but will plan and carry out the work independently. Prospectus and thesis plan must be approved by the MSES Program Director/committee before student registers for this course. (F, W, S).
Restriction(s):
Can enroll if Class is Graduate
* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Psychology

The Behavioral Sciences Department at University of Michigan-Dearborn offers a Master of Science (MS) in Psychology in two specializations.

The Specialization in Clinical Health Psychology (p. 859) is a two-year 48-credit program that trains mental health care providers to work in primary care settings, as well as more traditional clinical psychology settings.

The Specialization in Health Psychology (p. 865) is a two-year 39-credit program that provides students with intensive training in one or more content areas within Health Psychology

PSYC 505  Gender Roles  3 Credit Hours
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 443. Students cannot receive credit for both SOC 443 and SOC 543. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201
Restriction(s):
Can enroll if Class is Graduate

PSYC 507  Psychology of Adolescence  3 Credit Hours
Considers adolescence as an interaction of rapid biological and social change. Examines the theoretical and empirical literature in some detail. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 407. Students cannot receive credit for both PSYC 407 and PSYC 507. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 515  Lab in Developmental Psych  3 Credit Hours
An examination of research design and methodology as related to developmental psychology. Special emphasis will be given to training students in data collection techniques used in developmental research and in providing practical experience in designing and conducting research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 415. Students cannot receive credit for both PSYC 415 and PSYC 515. (YR).
Prerequisite(s): PSYC 300 or PSYC 302 or PSYC 315 or PSYC 407 or PSYC 418 or PSYC 507 or PSYC 518
Restriction(s):
Can enroll if Class is Graduate

PSYC 518  Cognitive Development  3 Credit Hours
This course explores theories and methods in cognitive development focusing on Piaget's theory and more recent significant conceptualizations. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 418. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 522  Psychology of Leadership  3 Credit Hours
Analysis of theories and research findings in the field of leadership. Class will participate in and observe leadership-group interactions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 422. Students cannot receive credit for both PSYC 422 and PSYC 522. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 523  Multicultural Counseling  3 Credit Hours
This course will explore multicultural issues in counseling and clinical psychology. The central focus for this course will be ethnic and racial diversity, although attention will be given to gender, sexual orientation, age and socio-economic status as they relate to issues of diversity in counseling. Students will gain an appreciation of the complexities of the influence of culture on social, emotional, behavioral and cognitive development, and the major issues involved in assessment and treatment of diverse clients and their families. (F)
Restriction(s):
Can enroll if Class is Graduate

PSYC 530  Psychology in the Workplace  3 Credit Hours
This course introduces students to some of the core content areas of Industrial/Organizational (I/O) psychology. These content areas include: selection, training, performance appraisal, work teams, job design, motivation, leadership, union-management relations, and stress and health in the workplace. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4305. Students cannot receive credit for both PSYC 4305 and PSYC 530. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or OB 354 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate
PSYC 531 Organizational Entry 3 Credit Hours
An in-depth consideration of the psychological aspects of the organizational entry process. Topics include recruitment, selection, orientation, socialization, and training. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both PSYC 431 and PSYC 531. (OC).
**Prerequisite(s):** PSYC 170* or HRM 405* or PSYC 171*
**Restriction(s):**
Can enroll if Class is Graduate

PSYC 532 Socialization of the Child 3 Credit Hours
An in-depth consideration of some major social systems that affect the development of the child. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 432. Students cannot receive credit for both PSYC 432 and PSYC 532. (YR).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Class is Graduate

PSYC 540 Abnormal Psychology 3 Credit Hours
An introduction to the field of psychopathology, the study of mental disorders. Includes exposure to a number of historical and theoretical perspectives, each with their own theories, methodologies, and treatment approaches. Disorders covered will include: anxiety and mood disorders, personality disorders, schizophrenia, sexual disorders, and psychosomatic disorders. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 440. Students cannot receive credit for both PSYC 440 and PSYC 540. (YR).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Class is Graduate

PSYC 542 Child Psychopathology 3 Credit Hours
A review of the major psychological disorders of children from birth to adolescence. These disorders are considered from a clinical and theoretical point of view. In addition to an examination of causes, approaches to treatment and behavior modifications are considered. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 442. Students cannot receive credit for both PSYC 442 and PSYC 542. (YR).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Class is Graduate

PSYC 544 Personality Assessment 4 Credit Hours
This is a course in methods of assessing personality. The theory and methods of observation, interviewing, and psychological testing are discussed and then employed in brief, individually-designed studies. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4445. Students cannot receive credit for both PSYC 4445 and PSYC 544. (AY).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Class is Graduate

PSYC 545 Advanced Psychopathology 3 Credit Hours
This course is designed for graduate students who require an advanced knowledge of psychological disorders and their diagnosis. Course content includes an overview of the symptoms, etiology, and treatment alternatives for major psychological disorders. The emphasis includes both an overview of research based knowledge and practical application of the current diagnostic system.
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Level is Graduate
Can enroll if College is Arts, Sciences, and Letters
Can enroll if Program is MS-Psychology

PSYC 546 Human Sexual Behavior 3 Credit Hours
A comprehensive review of facts about human sexuality. The emphasis is on psychological aspects of sex, but there is also a consideration of genetic, physiological, and anatomical aspects of sex, and contemporary issues. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 446. Students cannot receive credit for both PSYC 446 and PSYC 546. (AY).
**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101
**Restriction(s):**
Can enroll if Class is Graduate

PSYC 547 Therapeutic Intervention 4 Credit Hours
This course provides an introduction to the theories, practice, and ethical issues in clinical psychology. The emphasis is on the application of psychotherapeutic processes. Topics include ethical practices, formation of a therapeutic relationship, use of basic counseling skills, differing clinical orientations, and a review of relevant research. (W)
**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Program is MS-Psychology

PSYC 548 Psychological Assessment I 4 Credit Hours
This course is the first of a two-course sequence for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of interviewing, behavioral observations, and personality tests used in clinical practice. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. Only individuals admitted to the Clinical Health Psychology program can enroll. (S,YR)
**Prerequisite(s):** PSYC 545
**Restriction(s):**
Can enroll if Program is MS-Psychology

PSYC 549 Psychological Assessment II 4 Credit Hours
This course is the second of a two-course sequence designed for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of tests and measures used in clinical practice, particularly those used in the assessment of intelligence, achievement, adaptive behavior, and child evaluation. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. (F)
**Prerequisite(s):** PSYC 545
**Restriction(s):**
Can enroll if Class is Graduate
PSYC 550  Personality Theory  3 Credit Hours
A comparative review and examination of leading theories of personality, their basic concepts, similarities and differences, applications in clinical psychology, in education, social planning and in research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 450. Students cannot receive credit for both PSYC 450 and PSYC 550. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 552  Adv Tech in Therapeutic Inter  3 Credit Hours
This course introduces clinical health psychology graduate students to the theory and application of cognitive-behavioral therapy and mindfulness therapies. The course is aimed at providing students with a thorough understanding of the theory behind these modalities, as well as the experiential application of the associated therapy techniques in a clinical setting.
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 555  Health Psychology  3 Credit Hours
A discussion of the research on health promotion, psychological factors in the development of illness, cognitive representations of health and illness, stress and coping, social support, nutrition and exercise. Focus will be on the factors related to the development and maintenance of optimal health. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 557  Advanced Health Psychology  3 Credit Hours
This course will examine the research on psychological factors associated with the development and/or progression of illness, as well as psychological and social factors in health promotion. Topics include cognitive and social representation of health and illness, stress and coping, factors and interventions for behavioral change and the development of healthy lifestyles, and the treatment of psychological and behavioral risk factors for illness.
Restriction(s):
Can enroll if Level is Graduate
Can enroll if Program is MS-Psychology

PSYC 561  Learning and Memory  3 Credit Hours
A consideration of major theories and research results related to learning and memory. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 461. Students cannot receive credit for both PSYC 461 and PSYC 561. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 563  Sensation and Perception  3 Credit Hours
Analysis of basic sensory and perceptual phenomena with a review of relevant behavioral and physiological literature. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 463. Students cannot receive credit for both PSYC 463 and PSYC 563. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 564  Applied Cognitive Psych  3 Credit Hours
The focus will be on the application of principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language. (S,YR)

PSYC 565  Ind&Grp Tech in Clin Hlth Psyc  3 Credit Hours
An introduction to the variety of assessment and intervention procedures used by health psychologists in medical settings; issues in medical consultation and liaison. Techniques discussed fall in areas such as stress management, smoking cessation, weight management, and the treatment and prevention of cardiovascular disease, cancer, and HIV/AIDS. The theoretical, conceptual, and empirical bases of intervention will be stressed. Prerequisites required or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Class is Graduate

PSYC 570  Advanced Physiological Psych  3 Credit Hours
Further study of the subject matter of PSYC 431. Advanced study of topics in the area of psychology. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 470. Students cannot receive credit for both PSYC 470 and PSYC 570. (YR).
Prerequisite(s): PSYC 370
Restriction(s):
Can enroll if Class is Graduate

PSYC 571  Reproductive Physio & Behavior  3 Credit Hours
An in depth examination of reproduction from a physiological viewpoint. Physiological topics include anatomy, hormones, and neural mechanisms. Psychological topics include behavior development and descriptions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 471. Students cannot receive credit for both PSYC 471 and PSYC 571. (YR)
Prerequisite(s): PSYC 170 or PSYC 101 or PSYC 171
Restriction(s):
Can enroll if Class is Graduate

PSYC 572  Motivation and Behavior  3 Credit Hours
Study of the psychobiological aspects of motivated behavior. Topics include hunger, addiction, aggression, sleep, and achievement. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4725. Students cannot receive credit for both PSYC 4725 and PSYC 572. (YR)
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate
PSYC 574  Animal Learning and Cognition  3 Credit Hours
Animal Intelligence involves the study of human and non-human animal behavior and cognition in an evolutionary and comparative framework. As an introduction to human and non-human animal cognition and though processes this course will examine topics such as problem-solving, spatial cognition, categorization, memory, number concepts, tool-use and tool-production, insight, imitation, social cognition, self-recognition and language-like behavior. In addition to discussing basic experimental findings about cognition in animals, an emphasis is placed on the logic and evidence used to justify theoretical conclusions. The course requires reading and critiquing original journal articles in addition to textbook chapters for foundational concepts.
Prerequisite(s): PSYC 372 or PSYC 363 or PSYC 461 or BIOL 419 or BIOL 456 or ANTH 336
Restriction(s):
Can enroll if Class is Graduate

PSYC 575  Bio Foundations of Health Psyc  3 Credit Hours
Advanced study of the anatomical, physiological, and chemical correlates of behavior and mental processes, including the relationships among brain and body function/structure (neurochemistry, histology, anatomy), psychological variables (motor behavior, motivation, emotion, perception, learning, memory), health, and mental and physical illness. Integrates experimental and clinical research methodologies. Prerequisites or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 555 or PSYC 455 or PSYC 557
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 5825  Basic Methods Health Psych  3 Credit Hours
This course assumes a basic background in statistics and methodology and builds from there, with special emphasis on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 5835  Adv Methods Health Psych  3 Credit Hours
As a continuation of PSYC 5825, this course assumes a more advanced background in statistics and methodology. The course focuses on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include survey research, program evaluation, epidemiological research, qualitative research, MANCOVA, multiple regression, logistic regression, cluster analysis, and meta-analysis. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Prerequisite(s): PSYC 5825
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 584  Research Methods in Beh Med  3 Credit Hours
This course introduces graduate health psychology students to laboratory based research methods typically used in behavioral medicine. The focus is on laboratory methods of cardiovascular and pain research, specifically cardiovascular reactivity, heart rate variability, acute and chronic pain responses. The class also includes several special topics related to health psychology research (e.g., skin conductance, cortisol sampling, etc.). Students are responsible for physical implementation of research protocols, data analysis, and presentation of research findings.
Prerequisite(s): PSYC 557
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 585  Psychology Internship  3 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, developmental disabilities, geriatrics, human resources/staff development, probation departments, teenage runaways, substance abuse, and women's issues. The program involves training in listening and helping skills. Written permission of instructor is required. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 485. (F,W).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 588  Primatology Field Course  3 Credit Hours
This Primatology Field course will take students through an exploration of the scientific approach and methodology to the study of animal behavior. Students will gain experience in creating research projects and collecting data on free-ranging animals in a naturalistic environment. Preparation in lectures and activities on the campus of The University of Michigan-Dearborn will include learning about observational methods in detail, practicing developing ethograms and operational definitions, pilot data collection to modify the ethograms at the Detroit or Toledo Zoo, and use of GPS for data collection. Lecture materials will also cover topics of primate behavior and ecology. Students will spend a week observing a primate species (for example, one possible site for this field course may be to observe free-ranging lemurs at a reserve in Florida). Student's data collection at the field site will be for five continuous days. This field course provides a unique opportunity to study rare and endangered primates species in a safe and accessible environment. Short day trips to other facilities are possible, such as a visit to an ape sanctuary. Topics covered in this field course include advanced observational methods stemming from the field of Ethology, practical development of ethograms (checksheets) and research design, best practices in GPS data collection methods, and collating and summarizing data on animal behavior into a research paper. Lecture topics will address ethological methods and research design and also how to conduct research with free-ranging nonhuman primates. In addition there will be a strong focus on health and safety precautions in the field for human and nonhuman primates, acclimation to the field site, and practicalities of data collection. For graduate credit on this course, extra journal articles and longer written papers required than for the undergraduate requirements.
Prerequisite(s):
Can enroll if Class is Graduate

PSYC 557
PSYC 590  Adv Topics in Psychology  1 to 3 Credit Hours
This course provides an introduction to the field of psychoneuroimmunology. This area of study is concerned with the multidirectional communication between psychological processes such as stress or depression and central/peripheral nervous system, endocrine system, and immune system functioning. Ultimately, this field seeks to understand the relative contribution of psychological processes to traditional disease states (cardiovascular disease, pregnancy complications, etc.). Students will learn the basic functioning of the immune system, and pathways via endocrine and nervous system functioning by which psychological processes influence immune functioning. Finally, students will learn the current state of research examining the relationship between psychological processes and disease outcomes. Students cannot receive credit for both PSYC 590 and PSYC 490.
Prerequisite(s): PSYC 455 or PSYC 555
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 590E  Advanced Topics in Psychology  2 Credit Hours
topic: Research and Clinical Ethics. Provides graduate psychology students with extended examination of current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching.

PSYC 592  Individual Research  1 to 3 Credit Hours
No more than 6 hours may be counted for concentration. Arrangements will be made for adequately prepared students to undertake individual research under the direction of a member of the staff. The students, in electing, should indicate the staff member with whom the work has been arranged. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 492. Students cannot receive credit for both PSYC 492 and PSYC 592. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 593  Ethical Issues  3 Credit Hours
Provides graduate psychology students with current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching. (FYR)
Restriction(s):
Can enroll if Class is Graduate

PSYC 597  Health Psych Thesis Research  3 to 6 Credit Hours
Students electing the Thesis option in the last stage of the Master of Science in Health Psychology program will work under the general supervision of a member of the graduate faculty in the Behavioral Sciences Department but will plan and carry out the work independently. A prospectus for the thesis must be approved by the Master of Science in Health Psychology program director before the student registers for the course. The student will submit a report on the thesis and give an oral presentation to a panel of faculty members when the thesis is completed. (YR)
Restriction(s):
Can enroll if Class is Graduate

PSYC 698  Pract. Clinical Health Psyca  3 to 6 Credit Hours
The Practicum in Clinical Health Psychology offers students supervised clinical experience in a variety of clinical health and human service settings. The practicum is designed for students in the MS in Clinical Health Psychology program who have completed all coursework related to clinical diagnoses, assessment and therapy. Written permission of instructor or Program Director required.
Prerequisite(s): PSYC 545 and PSYC 547 and PSYC 548 and PSYC 549 and PSYC 565 and PSYC 593
Restriction(s):
Can enroll if Program is MS-Psychology

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Clinical Health Psychology
Master of Science: Specialization in Clinical Health Psychology
This two-year, 48-credit program trains mental health care providers to work with a variety of medical populations, as well as in more traditional clinical psychology settings. The curriculum of the program, in conjunction with 1 year of supervised postgraduate experience in an organized health care setting, is designed to fulfill the course requirements for the Michigan Limited License.

The Program
The 48-credit program consists of 11 required courses (36 credits) in core areas of Clinical Health Psychology. Six credit hours will be devoted to practicum in a community setting. Students will take either two elective courses or complete a master’s thesis under the supervision of program faculty.

Admission and Prerequisites
Admission decisions are based upon applicants’ records of academic achievement, Graduate Record Examination (general test) scores, letters of recommendation, and personal statements of education and career goals. More specifically a BA or BS in Psychology or a related major with a cumulative undergraduate GPA of at least 3.0 on a 4.0 scale and a minimum GRE score (general test) of approximately 300 are required for admission. Students without undergraduate psychology degrees are welcome to apply but will need Introductory Psychology, Statistics, and Abnormal Psychology; undergraduate Health Psychology and Research Methods are strongly recommended.

Application instructions can be found at: umdearborn.edu/gradapplynow

Each applicant should submit the following:
1. Official transcripts from all universities attended.
2. A 600-word statement of purpose describing the applicant’s personal history, educational and professional goals and personal objectives in pursuing the program. An additional 300-word statement describing the applicant’s potential effectiveness as a mental health
professional are required for students applying to the Clinical Health Psychology program.

3. Three letters of recommendation. (at least 2 from academic sources).
4. GRE Test Results (general test).
5. Students whose native language is not English are also required to satisfy the English Language Requirements for Admission which can be found in the General Information section of this catalog.

For more information, call 313-583-6321 or visit the clinical health psychology website.

**Plan of Work**

Students will be required to complete a Plan of Work during their first semester in the MS in Psychology: Specialization in Clinical Health Psychology program. The plan of work requires discussion between students and their program advisers. Copies will be retained by the student and the program director or program advisor.

**Degree Requirements**

To complete the degree program a minimum of 48 credits are required in the Behavioral Sciences. The following schedule provides the sequence of courses that students in the MS in Psychology: Specialization in Clinical Health Psychology program are expected to take. Although it is possible to take some of the courses out of sequence, many build on previous courses and all course schedules will need to be approved by the program director or your appointed program advisor.

**Specific Course Requirements**

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<th>Year 1</th>
<th>Credit Hours</th>
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<td><strong>Fall</strong></td>
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<tr>
<td>PSYC 557</td>
<td>Advanced Health Psychology</td>
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<td>PSYC 5825</td>
<td>Basic Methods Health Psych</td>
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<td>PSYC 545</td>
<td>Advanced Psychopathology</td>
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<td><strong>Winter</strong></td>
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<td>PSYC 575</td>
<td>Bio Foundations of Health Psych</td>
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<td><strong>Spring/Summer</strong></td>
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<td>PSYC 548</td>
<td>Psychological Assessment I</td>
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<td>PSYC 552</td>
<td>Adv Tech in Therapeutic Inter</td>
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<th>Year 2</th>
<th>Credit Hours</th>
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<td><strong>Fall</strong></td>
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<td>PSYC 593</td>
<td>Ethical Issues</td>
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<td>PSYC 697</td>
<td>Health Psych Thesis Research</td>
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| Total Credit Hours | 48 |

**Electives**

Students are required to have 6 credits in approved elective courses if they do not elect to complete a master’s thesis. Information about specific elective courses that will fulfill these requirements should be discussed with your program advisor or the program director each semester.

**Thesis**

Students in the MS in Psychology: Specialization in Clinical Health Psychology who choose to do so can elect to complete a 6 credit hour master’s thesis during their second year of the program. Students selecting this option will not be required to take any elective credits.

**Grade Requirements**

The grade grading system is intended to reflect higher standards of critical and creative scholarship than those applied at the undergraduate level. To receive a grade grade in courses open to both undergraduate and graduate students, the graduate student is expected to do work of superior quality and is required to do additional work specified by the instructor. Graduate students are required to earn a B (3.0) average or higher to satisfy degree requirements.

Grades of C+ and below are unsatisfactory for graduate level work and constitute valid cause for dropping a student from the graduate program. To be awarded a MS in Clinical Health Psychology, a student must have achieved at least a 3.0 grade point average (a B average). C+ grades in the core classes, PSYC 545, PSYC 547, PSYC 548, PSYC 549, PSYC 552, PSYC 553, and PSYC 698 will not be applied toward the MS in Psychology: Specialization in Clinical Health Psychology.
degree. A grade of B- or higher is required in each of these classes. Students may re-take the class one time to raise the grade to an acceptable level. Furthermore, no more than two grades of C- or lower will not be applied toward the MS in Psychology. Students who fail to maintain a 3.0 average or have more than two C- or lower grades will be placed on academic probation for the term following the lapse. Upon the recommendation of the program director, a student may be granted an opportunity to correct the scholastic and/or academic deficiency. Students who fail to meet program requirements may be denied permission to register or may be required to withdraw from the program.

**PSYC 505  Gender Roles  3 Credit Hours**
This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 407. Students cannot receive credit for both PSYC 407 and PSYC 507. (YR).

**Prerequisite(s):** PSYC 170 or PSYC 171 or SOC 200 or SOC 201

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 507  Psychology of Adolescence  3 Credit Hours**
Considers adolescence as an interaction of rapid biological and social change. Examines the theoretical and empirical literature in some detail. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 407. Students cannot receive credit for both PSYC 407 and PSYC 507. (YR).

**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 512  Psychology of Aging  3 Credit Hours**
This course examines development of the individual from middle adulthood through old age. Special emphasis is given to the understanding of developmental theories and issues in adulthood. Topics include biological basis, socialization, family relationships, personality, and intellectual development in the aging individual. (FW)

**Restriction(s):** Can enroll if Level is Graduate

**PSYC 515  Lab in Developmental Psych  3 Credit Hours**
An examination of research design and methodology as related to developmental psychology. Special emphasis will be given to training students in data collection techniques used in developmental research and in providing practical experience in designing and conducting research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 415. Students cannot receive credit for both PSYC 415 and PSYC 515. (YR).

**Prerequisite(s):** PSYC 300 or PSYC 302 or PSYC 315 or PSYC 407 or PSYC 418 or PSYC 507 or PSYC 518

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 518  Cognitive Development  3 Credit Hours**
This course explores theories and methods in cognitive development focusing on Piaget's theory and more recent significant conceptualizations. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 418. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).

**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 522  Psychology of Leadership  3 Credit Hours**
Analysis of theories and research findings in the field of leadership. Class will participate in and observe leadership-group interactions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 422. Students cannot receive credit for both PSYC 422 and PSYC 522. (YR).

**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 523  Multicultural Counseling  3 Credit Hours**
This course will explore multicultural issues in counseling and clinical psychology. The central focus for this course will be ethnic and racial diversity, although attention will be given to gender, sexual orientation, age and socio-economic status as they relate to issues of diversity in counseling. Students will gain an appreciation of the complexities of the influence of culture on social, emotional, behavioral and cognitive development, and the major issues involved in assessment and treatment of diverse clients and their families. (F)

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 530  Psychology in the Workplace  3 Credit Hours**
This course introduces students to some of the core content areas of Industrial/Organizational (I/O) psychology. These content areas include: selection, training, performance appraisal, work teams, job design, motivation, leadership, union-management relations, and stress and health in the workplace. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4305. Students cannot receive credit for both PSYC 4305 and PSYC 530. (YR).

**Prerequisite(s):** PSYC 170 or PSYC 171 or OB 354 or PSYC 101

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 531  Organizational Entry  3 Credit Hours**
An in-depth consideration of the psychological aspects of the organizational entry process. Topics include recruitment, selection, orientation, socialization, and training. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both PSYC 431 and PSYC 531. (OC).

**Prerequisite(s):** PSYC 170* or HRM 405* or PSYC 171*

**Restriction(s):** Can enroll if Class is Graduate

**PSYC 532  Socialization of the Child  3 Credit Hours**
An in-depth consideration of some major social systems that affect the development of the child. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 432. Students cannot receive credit for both PSYC 432 and PSYC 532. (YR).

**Prerequisite(s):** PSYC 170 or PSYC 171 or PSYC 101

**Restriction(s):** Can enroll if Class is Graduate
PSYC 540 Abnormal Psychology 3 Credit Hours
An introduction to the field of psychopathology, the study of mental disorders. Includes exposure to a number of historical and theoretical perspectives, each with their own theories, methodologies, and treatment approaches. Disorders covered will include: anxiety and mood disorders, personality disorders, schizophrenia, sexual disorders, and psychosomatic disorders. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 440. Students cannot receive credit for both PSYC 440 and PSYC 540. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 542 Child Psychopathology 3 Credit Hours
A review of the major psychological disorders of children from birth to adolescence. These disorders are considered from a clinical and theoretical point of view. In addition to an examination of causes, approaches to treatment and behavior modifications are considered. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 442. Students cannot receive credit for both PSYC 442 and PSYC 542. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 544 Personality Assessment 4 Credit Hours
This is a course in methods of assessing personality. The theory and methods of observation, interviewing, and psychological testing are discussed and then employed in brief, individually-designed studies. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 444. Students cannot receive credit for both PSYC 444 and PSYC 544. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 545 Advanced Psychopathology 3 Credit Hours
This course is designed for graduate students who require an advanced knowledge of psychological disorders and their diagnosis. Course content includes an overview of the symptoms, etiology, and treatment alternatives for major psychological disorders. The emphasis includes both an overview of research based knowledge and practical application of the current diagnostic system.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate
Can enroll if College is Arts, Sciences, and Letters
Can enroll if Program is MS-Psychology

PSYC 546 Human Sexual Behavior 3 Credit Hours
A comprehensive review of facts about human sexuality. The emphasis is on psychological aspects of sex, but there is also a consideration of genetic, physiological, and anatomical aspects of sex, and contemporary issues. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 446. Students cannot receive credit for both PSYC 446 and PSYC 546. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 547 Therapeutic Intervention 4 Credit Hours
This course provides an introduction to the theories, practice, and ethical issues in clinical psychology. The emphasis is on the application of psychotherapeutic processes. Topics include ethical practices, formation of a therapeutic relationship, use of basic counseling skills, differing clinical orientations, and a review of relevant research. (W)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Program is MS-Psychology

PSYC 548 Psychological Assessment I 4 Credit Hours
This course is the first of a two-course sequence for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of interviewing, behavioral observations, and personality tests used in clinical practice. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. Only individuals admitted to the Clinical Health Psychology program can enroll. (S,YR)
Prerequisite(s): PSYC 545
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 549 Psychological Assessment II 4 Credit Hours
This course is the second of a two-course sequence designed for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of tests and measures used in clinical practice, particularly those used in the assessment of intelligence, achievement, adaptive behavior, and child evaluation. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. (F)
Prerequisite(s): PSYC 545
Restriction(s):
Can enroll if Class is Graduate

PSYC 550 Personality Theory 3 Credit Hours
A comparative review and examination of leading theories of personality, their basic concepts, similarities and differences, applications in clinical psychology, in education, social planning and in research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 450. Students cannot receive credit for both PSYC 450 and PSYC 550. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 552 Adv Tech in Therapeutic Inter 3 Credit Hours
This course introduces clinical health psychology graduate students to the theory and application of cognitive-behavioral therapy and mindfulness therapies. The course is aimed at providing students with a thorough understanding of the theory behind these modalities, as well as the experiential application of the associated therapy techniques in a clinical setting.
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Program is MS-Psychology
PSYC 555   Health Psychology   3 Credit Hours
A discussion of the research on health promotion, psychological factors in the development of illness, cognitive representations of health and illness, stress and coping, social support, nutrition and exercise. Focus will be on the factors related to the development and maintenance of optimal health. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 557   Advanced Health Psychology   3 Credit Hours
This course will examine the research on psychological factors associated with the development and/or progression of illness, as well as psychological and social factors in health promotion. Topics include cognitive and social representation of health and illness, stress and coping, factors and interventions for behavioral change and the development of healthy lifestyles, and the treatment of psychological and behavioral risk factors for illness.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Program is MS-Psychology

PSYC 561   Learning and Memory   3 Credit Hours
A consideration of major theories and research results related to learning and memory. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 461. Students cannot receive credit for both PSYC 461 and PSYC 561. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 563   Sensation and Perception   3 Credit Hours
Analysis of basic sensory and perceptual phenomena with a review of relevant behavioral and physiological literature. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 463. Students cannot receive credit for both PSYC 463 and PSYC 563. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 564   Applied Cognitive Psych   3 Credit Hours
The focus will be on the application of principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language. (S,YR)

PSYC 565   Ind&Grp Tech in Cln Hlth Psy c   3 Credit Hours
An introduction to the variety of assessment and intervention procedures used by health psychologists in medical settings; issues in medical consultation and liaison. Techniques discussed fall in areas such as stress management, smoking cessation, weight management, and the treatment and prevention of cardiovascular disease, cancer, and HIV/AIDS. The theoretical, conceptual, and empirical bases of intervention will be stressed. Prerequisites required or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Class is Graduate

PSYC 570   Advanced Physiological Psych   3 Credit Hours
Further study of the subject matter of PSYC 431. Advanced study of topics in the area of psychology. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 470. Students cannot receive credit for both PSYC 470 and PSYC 570. (YR).
Prerequisite(s): PSYC 370
Restriction(s):
Can enroll if Class is Graduate

PSYC 571   Reproductive Physio & Behavior   3 Credit Hours
An in depth examination of reproduction from a physiological viewpoint. Physiological topics include anatomy, hormones, and neural mechanisms. Psychological topics include behavior development and descriptions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 471. Students cannot receive credit for both PSYC 471 and PSYC 571. (YR)
Prerequisite(s): PSYC 170 or PSYC 101 or PSYC 171
Restriction(s):
Can enroll if Class is Graduate

PSYC 572   Motivation and Behavior   3 Credit Hours
Study of the psychobiological aspects of motivated behavior. Topics include hunger, addiction, aggression, sleep, and achievement. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 472. Students cannot receive credit for both PSYC 472 and PSYC 572. (YR)
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 574   Animal Learning and Cognition   3 Credit Hours
Animal Intelligence involves the study of human and non-human animal behavior and cognition in an evolutionary and comparative framework. As an introduction to human and non-human animal cognition and though processes this course will examine topics such as problem-solving, spatial cognition, categorization, memory, number concepts, tool-use and tool-production, insight, imitation, social cognition, self-recognition and language-like behavior. In addition to discussing basic experimental findings about cognition in animals, an emphasis is placed on the logic and evidence used to justify theoretical conclusions. The course requires reading and critiquing original journal articles in addition to textbook chapters for foundational concepts.
Prerequisite(s): PSYC 372 or PSYC 363 or PSYC 461 or BIOL 419 or BIOL 456 or ANTH 336
Restriction(s):
Can enroll if Class is Graduate

PSYC 575   Bio Foundations of Health Psyc   3 Credit Hours
Advanced study of the anatomical, physiological, and chemical correlates of behavior and mental processes, including the relationships among brain and body function/structure (neurochemistry, histology, anatomy), psychological variables (motor behavior, motivation, emotion, perception, learning, memory), health, and mental and physical illness. Integrates experimental and clinical research methodologies. Prerequisites or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 555 or PSYC 455 or PSYC 557
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate
PSYC 5825  Basic Methods Health Psych  3 Credit Hours
This course assumes a basic background in statistics and methodology and builds from there, with special emphasis on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 5835  Adv Methods Health Psych  3 Credit Hours
As a continuation of PSYC 5825, this course assumes a more advanced background in statistics and methodology. The course focuses on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include survey research, program evaluation, epidemiological research, qualitative research, MANCOVA, multiple regression, logistic regression, cluster analysis, and meta-analysis. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Prerequisite(s): PSYC 5825
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 584  Research Methods in Beh Med  3 Credit Hours
This course introduces graduate health psychology students to laboratory based research methods typically used in behavioral medicine. The focus is on laboratory methods of cardiovascular and pain research, specifically cardiovascular reactivity, heart rate variability, acute and chronic pain responses. The class also includes several special topics related to health psychology research (e.g., skin conductance, cortisol sampling, etc.). Students are responsible for physical implementation of research protocols, data analysis, and presentation of research findings.
Prerequisite(s): PSYC 557
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 585  Psychology Internship  3 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, developmental disabilities, geriatrics, human resources/staff development, probation departments, teenage runaways, substance abuse, and women's issues. The program involves training in listening and helping skills. Written permission of instructor is required. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 485. (F,W).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 588  Primatology Field Course  3 Credit Hours
This Primatology Field course will take students through an exploration of the scientific approach and methodology to the study of animal behavior. Students will gain experience in creating research projects and collecting data on free-ranging animals in a naturalistic environment. Preparation in lectures and activities on the campus of The University of Michigan-Dearborn will include learning about observational methods in detail, practicing developing ethograms and operational definitions, pilot data collection to modify the ethograms at the Detroit or Toledo Zoo, and use of GPS for data collection. Lecture materials will also cover topics of primate behavior and ecology. Students will spend a week observing a primate species (for example, one possible site for this field course may be to observe free-ranging lemurs at a reserve in Florida). Student's data collection at the field site will be for five continuous days. This field course provides a unique opportunity to study rare and endangered primates species in a safe and accessible environment. Short day trips to other facilities are possible, such as a visit to an ape sanctuary. Topics covered in this field course include advanced observational methods stemming from the field of Ethology, practical development of ethograms (checksheets) and research design, best practices in GPS data collection methods, and collating and summarizing data on animal behavior into a research paper. Lecture topics will address ethological methods and research design and also how to conduct research with free-ranging nonhuman primates. In addition there will be a strong focus on health and safety precautions in the field for human and nonhuman primates, acclimation to the field site, and practicalities of data collection. For graduate credit on this course, extra journal articles and longer written papers required than for the undergraduate requirements.
Restriction(s):
Cannot enroll if Class is Freshman

PSYC 590  Adv Topics in Psychology  1 to 3 Credit Hours
This course provides an introduction to the field of psychoneuroimmunology. This area of study is concerned with the multidirectional communication between psychological processes such as stress or depression and central/peripheral nervous system, endocrine system, and immune system functioning. Ultimately, this field seeks to understand the relative contribution of psychological processes to traditional disease states (cardiovascular disease, pregnancy complications, etc.). Students will learn the basic functioning of the immune system, and pathways via endocrine and nervous system functioning by which psychological processes influence immune functioning. Finally, students will learn the current state of research examining the relationship between psychological processes and disease outcomes. Students cannot receive credit for both PSYC 590 and PSYC 490.
Prerequisite(s): PSYC 455 or PSYC 555
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 590E  Advanced Topics in Psychology  2 Credit Hours
This course provides an introduction to the field of psychoneuroimmunology. This area of study is concerned with the multidirectional communication between psychological processes such as stress or depression and central/peripheral nervous system, endocrine system, and immune system functioning. Ultimately, this field seeks to understand the relative contribution of psychological processes to traditional disease states (cardiovascular disease, pregnancy complications, etc.). Students will learn the basic functioning of the immune system, and pathways via endocrine and nervous system functioning by which psychological processes influence immune functioning. Finally, students will learn the current state of research examining the relationship between psychological processes and disease outcomes. Students cannot receive credit for both PSYC 590 and PSYC 490.
Prerequisite(s): PSYC 455 or PSYC 555
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 557  Research Methods in Beh Med  3 Credit Hours
As the companion course to PSYC 5825, this course assumes an advanced background in statistics and methodology. The focus is on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).

PSYC 455  Basic Methods Health Psych  3 Credit Hours
This course assumes a basic background in statistics and methodology and builds from there, with special emphasis on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).

PSYC 5825  Internship in Health Psych  3 Credit Hours
This course requires students to complete 150 hours of supervised experience in an organization providing health psychology services. Students may choose to complete this credit hour requirement by working in a variety of settings, including hospitals, clinics, or community health centers. The course involves the completion of a comprehensive internship portfolio that outlines the student's goals, objectives, and competencies achieved during the internship experience. The portfolio is submitted to the instructor for evaluation. Students are required to attend regular class meetings to discuss their experiences and progress. (F,W).

PSYC 5835  Advanced Methods Health Psych  3 Credit Hours
As a continuation of PSYC 5825, this course assumes a more advanced background in statistics and methodology. The focus is on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).

PSYC 490  Internship in Health Psych  3 Credit Hours
This course requires students to complete 150 hours of supervised experience in an organization providing health psychology services. Students may choose to complete this credit hour requirement by working in a variety of settings, including hospitals, clinics, or community health centers. The course involves the completion of a comprehensive internship portfolio that outlines the student's goals, objectives, and competencies achieved during the internship experience. The portfolio is submitted to the instructor for evaluation. Students are required to attend regular class meetings to discuss their experiences and progress. (F,W).

PSYC 590  Advanced Topics in Psychology  1 to 3 Credit Hours
This course provides an introduction to the field of psychoneuroimmunology. This area of study is concerned with the multidirectional communication between psychological processes such as stress or depression and central/peripheral nervous system, endocrine system, and immune system functioning. Ultimately, this field seeks to understand the relative contribution of psychological processes to traditional disease states (cardiovascular disease, pregnancy complications, etc.). Students will learn the basic functioning of the immune system, and pathways via endocrine and nervous system functioning by which psychological processes influence immune functioning. Finally, students will learn the current state of research examining the relationship between psychological processes and disease outcomes. Students cannot receive credit for both PSYC 590 and PSYC 490.
Prerequisite(s): PSYC 455 or PSYC 555
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 557  Research Methods in Beh Med  3 Credit Hours
As the companion course to PSYC 5825, this course assumes an advanced background in statistics and methodology. The focus is on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).

PSYC 455  Basic Methods Health Psych  3 Credit Hours
This course assumes a basic background in statistics and methodology and builds from there, with special emphasis on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Health Psychology  
Master of Science: Specialization in Health Psychology  

This two-year, 39-credit program is designed for the student who wishes to obtain a research-oriented graduate degree in the Behavioral Sciences. This program focuses on theory and research in Health Psychology. The program is intended to serve several populations including students who would like to continue graduate training in a research-related behavioral sciences field, as well as individuals who require an advanced degree to further their careers. It should be noted that this program is not intended to lead to limited licensure as a clinician in Michigan.

The Program  
The 39-credit program consists of 24 hours (8 courses) in core areas of Health Psychology. Students will complete either a 3-credit project or a 6-credit thesis under the supervision of program faculty. The remaining 9-12 credits will be composed of elective courses that focus on one or more content areas.

Admission and Prerequisites  
Admission decisions are based upon applicants’ records of academic achievement, Graduate Record Examination (general test) scores, letters of recommendation, and personal statements of education and career goals. More specifically: a BA or BS in Psychology or a related major with a cumulative undergraduate GPA of at least 3.0 (4.0 scale) and a minimum GRE score (general test) of approximately 300 are required for admission. Students without undergraduate psychology degrees are welcome to apply but will need Introductory Psychology, Statistics, and Abnormal Psychology; undergraduate Health Psychology and Research Methods are strongly recommended.

Application instructions can be found at: umdearborn.edu/gradapplynow  

Each applicant should submit the following:

1. Official transcripts from all universities attended.
2. A 600-word statement of purpose describing the applicant’s personal history, educational and professional goals and personal objectives in pursuing the program.
3. Three letters of recommendation. (at least 2 from academic sources).
4. GRE Test Results (general test).
5. Students whose native language is not English are also required to satisfy the English Language Requirements for Admission which can be found in the General Information section of this catalog.

For more information, call 313-583-6321 or visit the health psychology website.

**Plan of Work**  

Students will be required to complete a plan of work during their first semester in the MS in Psychology: Specialization in Health Psychology program. The plan of work requires discussion between students and their program advisers. Copies will be retained by the student and the program director or program advisor.

**Degree Requirements**  

To complete the degree program a minimum of 39 credits are required in the Behavioral Sciences. The following schedule provides the sequence of courses that students in the MS in Psychology: Specialization in Health Psychology program are expected to take. Although it is possible to take some of the courses out of sequence, many build on previous courses and all course schedules will need to be approved by the program director or your appointed program advisor.
Specific Course Requirements

Year 1
Fall

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<td>PSYC 557</td>
<td>Advanced Health Psychology</td>
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<td>PSYC 5825</td>
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<td>PSYC 575</td>
<td>Bio Foundations of Health Psych</td>
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<td>PPOL 506</td>
<td>Program Evaluation</td>
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Spring/Summer

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Year 2
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Winter

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<td>PSYC 697</td>
<td>Health Psych Thesis Research</td>
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Spring/Summer

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<td>PSYC 697</td>
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Electives

If PSYC 697 (thesis, 6 credits) completed, then 9 credit hours of electives is required. If PSYC 592 (project, 3 credits) completed, then 12 credit hours of electives is required. Examples of elective courses that would fulfill program requirements include: Advanced Psychopathology (PSYC 545), Multicultural Counseling (PSYC 523), Human Sexual Behavior (PSYC 546), and Medical Sociology (SOC 540). Courses elected as an undergraduate at UM-Dearborn may not be taken for graduate credit. More information about the specific elective courses that will fulfill program requirements should be discussed with your program advisor or the program director each semester.

Thesis/Project Requirements

Students in the MS in Psychology: Specialization in Health Psychology program will complete either a 3 credit Project (PSYC 592) or a 6 credit master’s thesis (PSYC 697) during their second year.

Grade Requirements

The graduate grading system is intended to reflect higher standards of critical and creative scholarship than those applied at the undergraduate level. To receive a graduate grade in courses open to both undergraduate and graduate students, the graduate student is expected to do work of superior quality and is required to do additional work specified by the instructor. Graduate students are required to earn a B (3.0) average or higher to satisfy degree requirements.

Grades of C+ and below are unsatisfactory for graduate level work and constitute valid cause for dropping a student from the graduate program. To be awarded the MS in Psychology: Specialization in Health Psychology, a student must have achieved at least a 3.0 GPA (a B average). No more than two grades of C may be applied toward the MS in Psychology: Specialization in Health Psychology degree; grades of C- or lower will not be applied toward the MS in Psychology: Specialization in Clinical Health Psychology. Students who fail to maintain a 3.0 average or have more than two C or lower grades will be placed on academic probation for the term following the lapse. Upon the recommendation of the Program Director, a student may be granted an opportunity to correct the scholastic and/or academic deficiency. Students who fail to meet program requirements may be denied permission to register or may be required to withdraw from the program.

Elective Courses

If PSYC 697 (thesis, 6 credits) completed, then 9 credit hours of electives is required. If PSYC 592 (project, 3 credits) completed, then 12 credit hours of electives is required. Examples of elective courses that would fulfill program requirements include: Advanced Psychopathology (PSYC 545), Multicultural Counseling (PSYC 523), Human Sexual Behavior (PSYC 546), and Medical Sociology (SOC 540). Courses elected as an undergraduate at UM-Dearborn may not be taken for graduate credit. More information about the specific elective courses that will fulfill program requirements should be discussed with your program advisor or the program director each semester.

Thesis/Project Requirements

Students in the MS in Psychology: Specialization in Health Psychology program will complete either a 3 credit Project (PSYC 592) or a 6 credit master’s thesis (PSYC 697) during their second year.

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PSYC 505   Gender Roles   3 Credit Hours

This course will investigate the development of gender roles in childhood and adolescence due to either innate physiological differences or sociological patterning, the effect of gender roles upon male-female relationships within our society, and the possibility of transcending sociological gender roles in alternate modes of living. Additional reading assignments or projects will distinguish this course from its undergraduate version SOC 443. Students cannot receive credit for both SOC 443 and SOC 543. (YR).

Prerequisite(s): PSYC 170 or PSYC 171 or SOC 200 or SOC 201

Restriction(s):
Can enroll if Class is Graduate

PSYC 507   Psychology of Adolescence   3 Credit Hours

Considers adolescence as an interaction of rapid biological and social change. Examines the theoretical and empirical literature in some detail. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 407. Students cannot receive credit for both PSYC 407 and PSYC 507. (YR).

Prerequisite(s): PSYC 170 or PSYC 171 or SOC 101

Restriction(s):
Can enroll if Class is Graduate
PSYC 512  Psychology of Aging  3 Credit Hours
This course examines development of the individual from middle adulthood through old age. Special emphasis is given to the understanding of developmental theories and issues in adulthood. Topics include biological basis, socialization, family relationships, personality, and intellectual development in the aging individual. (F,W)
Restriction(s):
Can enroll if Level is Graduate

PSYC 515  Lab in Developmental Psych  3 Credit Hours
An examination of research design and methodology as related to developmental psychology. Special emphasis will be given to training students in data collection techniques used in developmental research and in providing practical experience in designing and conducting research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 415. Students cannot receive credit for both PSYC 415 and PSYC 515. (YR).
Prerequisite(s): PSYC 300 or PSYC 302 or PSYC 315 or PSYC 407 or PSYC 418 or PSYC 507 or PSYC 518
Restriction(s):
Can enroll if Class is Graduate

PSYC 518  Cognitive Development  3 Credit Hours
This course explores theories and methods in cognitive development focusing on Piaget’s theory and more recent significant conceptualizations. Topics include stages of cognitive development, types of inferential processes, and the acquisition of world knowledge. Discussions leading to the formation of new research ideas are emphasized. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 418. Students cannot receive credit for both PSYC 418 and PSYC 518. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 522  Psychology of Leadership  3 Credit Hours
Analysis of theories and research findings in the field of leadership. Class will participate in and observe leadership-group interactions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 422. Students cannot receive credit for both PSYC 422 and PSYC 522. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 523  Multicultural Counseling  3 Credit Hours
This course will explore multicultural issues in counseling and clinical psychology. The central focus for this course will be ethnic and racial diversity, although attention will be given to gender, sexual orientation, age and socio-economic status as they relate to issues of diversity in counseling. Students will gain an appreciation of the complexities of the influence of culture on social, emotional, behavioral and cognitive development, and the major issues involved in assessment and treatment of diverse clients and their families. (F)
Restriction(s):
Can enroll if Class is Graduate

PSYC 530  Psychology in the Workplace  3 Credit Hours
This course introduces students to some of the core content areas of Industrial/Organizational (I/O) psychology. These content areas include: selection, training, performance appraisal, work teams, job design, motivation, leadership, union-management relations, and stress and health in the workplace. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4305. Students cannot receive credit for both PSYC 4305 and PSYC 530. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or OB 354 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 531  Organizational Entry  3 Credit Hours
An in-depth consideration of the psychological aspects of the organizational entry process. Topics include recruitment, selection, orientation, socialization, and training. Additional reading assignments or projects will distinguish this course from its undergraduate version. Students cannot receive credit for both PSYC 431 and PSYC 531. (OG).
Prerequisite(s): PSYC 170* or HRM 405* or PSYC 171*
Restriction(s):
Can enroll if Class is Graduate

PSYC 532  Socialization of the Child  3 Credit Hours
An in-depth consideration of some major social systems that affect the development of the child. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 432. Students cannot receive credit for both PSYC 432 and PSYC 532. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 540  Abnormal Psychology  3 Credit Hours
An introduction to the field of psychopathology, the study of mental disorders. Includes exposure to a number of historical and theoretical perspectives, each with their own theories, methodologies, and treatment approaches. Disorders covered will include: anxiety and mood disorders, personality disorders, schizophrenia, sexual disorders, and psychosomatic disorders. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 440. Students cannot receive credit for both PSYC 440 and PSYC 540. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 542  Child Psychopathology  3 Credit Hours
A review of the major psychological disorders of children from birth to adolescence. These disorders are considered from a clinical and theoretical point of view. In addition to an examination of causes, approaches to treatment and behavior modifications are considered. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 442. Students cannot receive credit for both PSYC 442 and PSYC 542. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate
PSYC 544  Personality Assessment  4 Credit Hours
This is a course in methods of assessing personality. The theory and methods of observation, interviewing, and psychological testing are discussed and then employed in brief, individually-designed studies. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4445. Students cannot receive credit for both PSYC 4445 and PSYC 544. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 545  Advanced Psychopathology  3 Credit Hours
This course is designed for graduate students who require an advanced knowledge of psychological disorders and their diagnosis. Course content includes an overview of the symptoms, etiology, and treatment alternatives for major psychological disorders. The emphasis includes both an overview of research based knowledge and practical application of the current diagnostic system.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate
Can enroll if College is Arts, Sciences, and Letters
Can enroll if Program is MS-Psychology

PSYC 546  Human Sexual Behavior  3 Credit Hours
A comprehensive review of facts about human sexuality. The emphasis is on psychological aspects of sex, but there is also a consideration of genetic, physiological, and anatomical aspects of sex, and contemporary issues. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 446. Students cannot receive credit for both PSYC 446 and PSYC 546. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 547  Therapeutic Intervention  4 Credit Hours
This course provides an introduction to the theories, practice, and ethical issues in clinical psychology. The emphasis is on the application of psychotherapeutic processes. Topics include ethical practices, formation of a therapeutic relationship, use of basic counseling skills, differing clinical orientations, and a review of relevant research. (W)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Program is MS-Psychology

PSYC 548  Psychological Assessment I  4 Credit Hours
This course is the first of a two-course sequence for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of interpreting, behavioral observations, and personality tests used in clinical practice. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. Only individuals admitted to the Clinical Health Psychology program can enroll. (AY)
Prerequisite(s): PSYC 545
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 549  Psychological Assessment II  4 Credit Hours
This course is the second of a two-course sequence designed for graduate students who require an advanced knowledge of psychological assessment. Course content includes an overview of tests and measures used in clinical practice, particularly those used in the assessment of intelligence, achievement, adaptive behavior, and child evaluation. The emphasis includes both an overview of research-based knowledge and practical application of assessment techniques through supervised lab experience. (F)
Prerequisite(s): PSYC 545
Restriction(s):
Can enroll if Class is Graduate

PSYC 550  Personality Theory  3 Credit Hours
A comparative review and examination of leading theories of personality, their basic concepts, similarities and differences, applications in clinical psychology, in education, social planning and in research. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 450. Students cannot receive credit for both PSYC 550 and PSYC 550. (AY).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 552  Adv Tech in Therapeutic Inter  3 Credit Hours
This course introduces clinical health psychology graduate students to the theory and application of cognitive-behavioral therapy and mindfulness therapies. The course is aimed at providing students with a thorough understanding of the theory behind these modalities, as well as the experiential application of the associated therapy techniques in a clinical setting.
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 555  Health Psychology  3 Credit Hours
A discussion of the research on health promotion, psychological factors in the development of illness, cognitive representations of health and illness, stress and coping, social support, nutrition and exercise. Focus will be on the factors related to the development and maintenance of optimal health. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 557  Advanced Health Psychology  3 Credit Hours
This course will examine the research on psychological factors associated with the development and/or progression of illness, as well as psychological and social factors in health promotion. Topics include cognitive and social representation of health and illness, stress and coping, factors and interventions for behavioral change and the development of healthy lifestyles, and the treatment of psychological and behavioral risk factors for illness.
Restriction(s):
Can enroll if Level is Graduate
Can enroll if Program is MS-Psychology

PSYC 561  Learning and Memory  3 Credit Hours
A consideration of major theories and research results related to learning and memory. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 461. Students cannot receive credit for both PSYC 461 and PSYC 561. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate
PSYC 563  Sensation and Perception  3 Credit Hours
Analysis of basic sensory and perceptual phenomena with a review of relevant behavioral and physiological literature. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 463. Students cannot receive credit for both PSYC 463 and PSYC 563. (YR).
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 564  Applied Cognitive Psych  3 Credit Hours
The focus will be on the application of principles of cognitive psychology (defined broadly to include sensation and perception) to benefit the student in real-life settings. Specific areas might include human factors, retention, recall, attention, reasoning, problem-solving, decision making, reading, comprehension, learning, and language. (S,YR)

PSYC 565  Ind&Grp Tech in Cln Hlth Psyc  3 Credit Hours
An introduction to the variety of assessment and intervention procedures used by health psychologists in medical settings; issues in medical consultation and liaison. Techniques discussed fall in areas such as stress management, smoking cessation, weight management, and the treatment and prevention of cardiovascular disease, cancer, and HIV/AIDS. The theoretical, conceptual, and empirical bases of intervention will be stressed. Prerequisites required or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 547
Restriction(s):
Can enroll if Class is Graduate

PSYC 570  Advanced Physiological Psych  3 Credit Hours
Further study of the subject matter of PSYC 431. Advanced study of topics in the area of psychology. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 470. Students cannot receive credit for both PSYC 470 and PSYC 570. (YR).
Prerequisite(s): PSYC 370
Restriction(s):
Can enroll if Class is Graduate

PSYC 571  Reproductive Physio & Behavior  3 Credit Hours
An in depth examination of reproduction from a physiological viewpoint. Physiological topics include anatomy, hormones, and neural mechanisms. Psychological topics include behavior development and descriptions. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 471. Students cannot receive credit for both PSYC 471 and PSYC 571. (YR)
Prerequisite(s): PSYC 170 or PSYC 101 or PSYC 171
Restriction(s):
Can enroll if Class is Graduate

PSYC 572  Motivation and Behavior  3 Credit Hours
Study of the psychobiological aspects of motivated behavior. Topics include hunger, addiction, aggression, sleep, and achievement. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 4725. Students cannot receive credit for both PSYC 4725 and PSYC 572. (YR)
Prerequisite(s): PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 574  Animal Learning and Cognition  3 Credit Hours
Animal Intelligence involves the study of human and non-human animal behavior and cognition in an evolutionary and comparative framework. As an introduction to human and non-human animal cognition and though processes this course will examine topics such as problem-solving, spatial cognition, categorization, memory, number concepts, tool-use and tool-production, insight, imitation, social cognition, self-recognition and language-like behavior. In addition to discussing basic experimental findings about cognition in animals, an emphasis is placed on the logic and evidence used to justify theoretical conclusions. The course requires reading and critiquing original journal articles in addition to textbook chapters for foundational concepts.
Prerequisite(s): PSYC 372 or PSYC 363 or PSYC 461 or BIOL 419 or BIOL 456 or ANTH 336
Restriction(s):
Can enroll if Class is Graduate

PSYC 575  Bio Foundations of Health Psyc  3 Credit Hours
Advanced study of the anatomical, physiological, and chemical correlates of behavior and mental processes, including the relationships among brain and body function/structure (neurochemistry, histology, anatomy), psychological variables (motor behavior, motivation, emotion, perception, learning, memory), health, and mental and physical illness. Integrates experimental and clinical research methodologies. Prerequisites or permission of instructor. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (YR).
Prerequisite(s): PSYC 555 or PSYC 455 or PSYC 557
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 5825  Basic Methods Health Psych  3 Credit Hours
This course assumes a basic background in statistics and methodology and builds from there, with special emphasis on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include multiple regression, ANOVA, ANCOVA, MANOVA, factor analysis, power, validity, experimental design, placebo effects, and random sampling. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Restriction(s):
Can enroll if Class is Senior or Graduate

PSYC 5835  Adv Methods Health Psych  3 Credit Hours
As a continuation of PSYC 5825, this course assumes a more advanced background in statistics and methodology. The course focuses on methodological issues and statistical techniques appropriate to Health Psychology. Computer skills related to statistical packages, databases, etc. will be stressed. Specific methods and analyses include survey research, program evaluation, epidemiological research, qualitative research, MANCOVA, multiple regression, logistic regression, cluster analysis, and meta-analysis. Preference will be given to students enrolled in the Master of Science in Health Psychology Program. (F).
Prerequisite(s): PSYC 5825
Restriction(s):
Can enroll if Class is Senior or Graduate
PSYC 584  Research Methods in Beh Med   3 Credit Hours
This course introduces graduate health psychology students to laboratory based research methods typically used in behavioral medicine. The focus is on laboratory methods of cardiovascular and pain research, specifically cardiovascular reactivity, heart rate variability, acute and chronic pain responses. The class also includes several special topics related to health psychology research (e.g., skin conductance, cortisol sampling, etc.). Students are responsible for physical implementation of research protocols, data analysis, and presentation of research findings. 
Prerequisite(s):  PSYC 557
Restriction(s):
Can enroll if Program is MS-Psychology

PSYC 585  Psychology Internship   3 Credit Hours
The psychology internship offers experience in a wide variety of placements dealing with human services. These include programs related to child abuse, crisis intervention, developmental disabilities, geriatrics, human resources/staff development, probation departments, teenage runaways, substance abuse, and women’s issues. The program involves training in listening and helping skills. Written permission of instructor is required. Additional reading assignments or projects will distinguish this course from its undergraduate version PSYC 485. (F,W).
Prerequisite(s):  PSYC 170 or PSYC 171 or PSYC 101
Restriction(s):
Can enroll if Class is Graduate

PSYC 588  Primatology Field Course   3 Credit Hours
This Primatology Field course will take students through an exploration of the scientific approach and methodology to the study of animal behavior. Students will gain experience in creating research projects and collecting data on free-ranging animals in a naturalistic environment. Preparation in lectures and activities on the campus of The University of Michigan-Dearborn will include learning about observational methods in detail, practicing developing ethograms and operational definitions, pilot data collection to modify the ethograms at the Detroit or Toledo Zoo, and use of GPS for data collection. Lecture materials will also cover topics of primate behavior and ecology. Students will spend a week observing a primate species (for example, one possible site for this field course may be to observe free-ranging lemurs at a reserve in Florida). Student data collection at the field site will be for five continuous days. This field course provides a unique opportunity to study rare and endangered primates species in a safe and accessible environment. Short day trips to other facilities are possible, such as a visit to an ape sanctuary. Topics covered in this field course include advanced observational methods stemming from the field of Ethology, practical development of ethograms (check sheets) and research design, best practices in GPS data collection methods, and collating and summarizing data on animal behavior into a research paper. Lecture topics will address ethological methods and research design and also how to conduct research with free-ranging nonhuman primates. In addition there will be a strong focus on health and safety precautions in the field for human and nonhuman primates, acclimation to the field site, and practicalities of data collection. For graduate credit on this course, extra journal articles and longer written papers required than for the undergraduate requirements. 
Restriction(s):
Cannot enroll if Class is Freshman

PSYC 589  Ethical Issues   3 Credit Hours
Provides graduate psychology students with current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching. 
Prerequisite(s):
Can enroll if Class is Graduate

PSYC 590  Adv Topics in Psychology   1 to 3 Credit Hours
This course provides an introduction to the field of psychoneuroimmunology. This area of study is concerned with the multidirectional communication between psychological processes such as stress or depression and central/peripheral nervous system, endocrine system, and immune system functioning. Ultimately, this field seeks to understand the relative contribution of psychological processes to traditional disease states (cardiovascular disease, pregnancy complications, etc). Students will learn the basic functioning of the immune system, and pathways via endocrine and nervous system functioning by which psychological processes influence immune functioning. Finally, students will learn the current state of research examining the relationship between psychological processes and disease outcomes. Students cannot receive credit for both PSYC 590 and PSYC 490.
Prerequisite(s):  PSYC 455 or PSYC 555
Restriction(s):
Can enroll if Class is Junior or Senior or Graduate

PSYC 590E  Advanced Topics in Psychology   2 Credit Hours
Topic: Research and Clinical Ethics. Provides graduate psychology students with extended examination of current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching. 
Prerequisite(s):
Can enroll if Class is Graduate

PSYC 592  Individual Research   1 to 3 Credit Hours
No more than 6 hours may be counted for concentration. Arrangements will be made for adequately prepared students to undertake individual research under the direction of a member of the staff. The students, in electing, should indicate the staff member with whom the work has been arranged. Additional reading assignments or projects will distinguish this course from its undergraduate verion PSYC 492. Students cannot receive credit for both PSYC 492 and PSYC 592. (YR).
Restriction(s):
Can enroll if Class is Graduate

PSYC 593  Ethical Issues   3 Credit Hours
Provides graduate psychology students with current information and decision making strategies on professional and ethical issues associated with service delivery, research, and teaching. (YR)
Restriction(s):
Can enroll if Class is Graduate

PSYC 597  Health Psych Thesis Research   3 to 6 Credit Hours
Students electing the Thesis option in the last stage of the Master of Science in Health Psychology program will work under the general supervision of a member of the graduate faculty in the Behavioral Sciences Department but will plan and carry out the work independently. A prospectus for the thesis must be approved by the Master of Science in Health Psychology program director before the student registers for the course. The student will submit a report on the thesis and give an oral presentation to a panel of faculty members when the thesis is completed. (YR)
Restriction(s):
Can enroll if Class is Graduate
PSYC 698  Pract. Clinical Health Psyc  3 to 6 Credit Hours
The Practicum in Clinical Health Psychology offers students supervised clinical experience in a variety of clinical health and human service settings. The practicum is designed for students in the MS in Clinical Health Psychology program who have completed all coursework related to clinical diagnoses, assessment and therapy. Written permission of instructor or Program Director required.
Prerequisite(s): PSYC 545 and PSYC 547 and PSYC 548 and PSYC 549 and PSYC 565 and PSYC 593
Restriction(s):
Can enroll if Program is MS-Psychology

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Public Administration and Policy
The Master of Public Administration and Policy (MPAP) program serves a diverse student body representing a variety of public service organizations. MPAP students are mainly mid-career professionals working in government or nonprofit organizations and committed to learning and developing as individuals, administrators, and policymakers. Our seminars are conveniently offered to accommodate full-time jobs.

The MPAP curriculum emphasizes the integration of practical skills and knowledge with an understanding of the concepts and theories that help leaders adapt those skills in an ever-changing environment. Our classes will develop and improve your skills in policy development and implementation, as well as leadership, personnel, strategic management, fundraising, and program evaluation. You will engage with your peers coming from various backgrounds, learn from each others' professional experiences, and master your ability to work in different organizational settings with diverse groups of individuals. You will engage with faculty whose research, academic training, and professional experience covers a wide array of public administration and policy areas and whose primary goal is to build a cadre of high caliber public and nonprofit leaders to enable our region, state, and nation to address contemporary and future challenges successfully.

Major Requirements

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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<td>Required Courses</td>
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<td>PAPP 502</td>
<td>Politics of Public Policy</td>
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<td>PAPP 505</td>
<td>Intro to Public Admin</td>
<td>3</td>
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<td>PAPP 540</td>
<td>Government &amp; Nonprofit Finance</td>
<td>3</td>
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<td>PAPP 560</td>
<td>Admin of Human Resources</td>
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<td>Stat Method for Decisionmaking</td>
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<td>PAPP 586</td>
<td>Ethics of Admin &amp; Public Pol</td>
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<td>PAPP 520</td>
<td>Govt &amp; Nonprofit Leadership</td>
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<td>PAPP 523</td>
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<td>PAPP 561</td>
<td>Organization Develop &amp; Theory</td>
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<td>Performance</td>
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<td>PAPP 581</td>
<td>Strategic Mgt for Pub Admin</td>
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<td>Policy Analysis &amp; Development</td>
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<td>PAPP 584</td>
<td>Revitalizing Cities</td>
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<td>PAPP 585</td>
<td>Admin Tech in Organizations</td>
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<td>PAPP 690</td>
<td>Direct Study in Pub Adm/Policy</td>
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Optional Concentrations
12 credits required

Evaluation & Assessment

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<td>PAPP 537</td>
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<td>PAPP 564</td>
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<td>Program Evaluation</td>
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Human Resources

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<tr>
<td>PAPP 520</td>
<td>Govt &amp; Nonprofit Leadership</td>
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<td>PAPP 555</td>
<td>Network Collaboration</td>
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Public Policy

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<td>PAPP 502</td>
<td>Politics of Public Policy</td>
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<td>PAPP 523</td>
<td>Administrative Law</td>
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<td>PAPP 537</td>
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<td>PAPP 584</td>
<td>Revitalizing Cities</td>
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<tr>
<td>PAPP 586</td>
<td>Ethics of Admin &amp; Public Pol</td>
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</table>
PAPP 500  Topics in Pub Admin & Policy  1 to 3 Credit Hours
This course will examine a major topic or set of related topics in public administration and/or public policy. The topics may change and, therefore, it is possible to take the course more than once. (OC)
Restriction(s):
Cannot enroll if Level is Graduate

PAPP 502  Politics of Public Policy  3 Credit Hours
This course explores how public policy is made in the United States, with a special emphasis on inter-relationships of policy and politics. We examine how political and other variables converge to create an often maddening, but inescapable, set of contradictions (a.k.a. paradoxes) that both hamper rationality and enable sustainability of our governmental systems. Policy and politics are inseparable. This course will help you understand why and assess the benefits and disadvantages of this reality. (W,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 505  Intro to Public Admin  3 Credit Hours
This introductory course provides an overview of topics encountered in government or nonprofit administrator positions. Topics emphasized in the seminar include decision making, finance, human resource, leadership, performance, accountability, organizational responsiveness, and strategic management. (F,AY)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 520  Govt & Nonprofit Leadership  3 Credit Hours
This course examines the complex but critical top of leadership in public affairs. It examines leadership theories, styles, and practices and how these affect the way that public and nonprofit organizations operate. (F,A,Y)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 523  Administrative Law  3 Credit Hours
This class will focus on important legal and regulatory issues as they relate to public, education, and nonprofit organizations. It will consider the various court and administrative decisions which affect these. Numerous case situations will be used to facilitate the students’ learning.
Restriction(s):
Can enroll if Level is Graduate

PAPP 527  Pub Relations for Govt/Nonprof  3 Credit Hours
This seminar explores the interaction of government and nonprofit organizations with the public. It is particularly concerned with the way these organizations communicate with citizens and organizations and engage them in their operations and decision-making. (S,A,Y)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 537  Behavioral Public Policy  3 Credit Hours
This course teaches you to apply the insights from behavioral economics and psychology to public policy design. Empirically-based behavioral science offers policy makers the opportunity to decrease the impact of psychological limitations of lazy or boundedly rational individuals. In this course we consider various public policies that are informed by behavioral science research in the areas of retirement savings, household borrowing, health care, energy use and choice of nutrition. (S,A,Y)
Prerequisite(s): ECON 201 and ECON 202
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 540  Government & Nonprofit Finance  3 Credit Hours
This course provides a critical understanding of finance for governmental and nonprofit organizations. Students examine how revenue is derived and spent, how organizations craft and manage budgets, and how accounting and financial reporting aid operations and transparency. Special attention is given to the ways in which the publicness of government and nonprofit organizations creates significant differences between their finances and those of business. (F,W)

PAPP 544  Grant Writing & Management  3 Credit Hours
This course prepares students planning careers in public and nonprofit organizations to win and manage grants for their organization. Students will learn how to research and identify strong grant prospects, build relationships with foundation program officers, draft letters of intent and full proposals, and manage grant funds once they are received. Students will also become familiar with public sector risk management associated with grant stewardship. (S,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate

PAPP 548  Fundraising  3 Credit Hours
The course will analyze the role of fundraising and philanthropy for nonprofits. The class will examine issues such as the cultural, political and economic supports and constraints within which nonprofit organizations operate. Students will be able to enhance their fundraising skills and their knowledge of the fundraising practices of nonprofits.
Restriction(s):
Can enroll if Class is Graduate

PAPP 555  Network Collaboration  3 Credit Hours
This course focuses on collaboration as a form of service delivery by government and nonprofits. It examines different types of collaboration across sectors, focusing on collaborative governance. Emphasis is placed on practical skills such as designing, managing, and evaluating collaborations, but critical conceptual aspects of network collaboration are also addressed. NOTE: The online course may require some synchronous participation in simulations and group exercises; dates and time will be determined by student groups. (GR)
Restriction(s):
Can enroll if Level is Graduate

PAPP 560  Admin of Human Resources  3 Credit Hours
This seminar will examine human resource administration activities in public, educational and nonprofit settings. Issues such as recruiting, selection, planning, performance appraisal, contracting and collective bargaining will be related to the overall administrative activities. Emphasis will be placed on the connections between human resource issues in public, education, and nonprofit organizations.
Restriction(s):
Can enroll if Level is Graduate

PAPP 561  Organization Develop & Theory  3 Credit Hours
This course focuses on organizational change. Students will learn why and how organizations pursue planned change to improve outcomes. They will explore topics of organization theory, such as organization culture, structure, power, and environmental influences on organizations, as well as behavioral science theories on individual and group behavior. Students will apply this knowledge in examining specific techniques used to stimulate and guide organizational change. (F,A,Y)
Restriction(s):
Can enroll if Level is Graduate
PAPP 562  Govt & Nonprof Labor Relations  3 Credit Hours
The seminar considers conceptual and practical aspects of management-labor relations in public and nonprofit settings, with an emphasis on labor unions, collective bargaining, and civil service. It also develops initial competency in the various activities associated with collective bargained situations. (OC)
Restriction(s):
Can enroll if Level is Graduate

PAPP 564  Performance  3 Credit Hours
Evaluating the performance of employees is crucial to the motivation of the individual and the success of the organization. Evaluating the performance of organizations helps leaders direct resources to areas where they can have the most impact. This class will consider the available methods for assessing individual and organizational performance in public and nonprofit settings. (S,AY)
Restriction(s):
Can enroll if Level is Graduate

PAPP 560  Admin & Policy Capstone  3 Credit Hours
This course critically examines ethical issues encountered by public administrators and policymakers. It examines ethical considerations related to managing people and other organizational resources and designing and implementing public policy. It seeks to help students identify, understand, and deal effectively with the ethical dimensions of leadership in the public and nonprofit sectors. (FW)
Restriction(s):
Can enroll if Level is Graduate

PAPP 690  Direct Study in Pub Adm/Policy  1 to 3 Credit Hours
This course introduces students to descriptive and basic inferential statistics and how organizational leaders can use them to aid decision making. (FW)
Restriction(s):
Can enroll if Level is Graduate

PAPP 695  Admin Tech in Organizations  3 Credit Hours
We examine strategies and practices used by government and nonprofit administrators to plan for and manage technology effectively within their organizations. (OC)
Restriction(s):
Can enroll if Level is Graduate

PAPP 580  Stat Method for Decisionmaking  3 Credit Hours
This course introduces students to descriptive and basic inferential statistics and how organizational leaders can use them to aid decision making. (FW)
Restriction(s):
Can enroll if Level is Graduate

PAPP 581  Strategic Mgt for Pub Admin  3 Credit Hours
This course examines concepts, tools, and actions used by administrators to ensure that their organizational resources are continually devoted to accomplishing the organization's mission. Crafting and communicating effective missions and visions, developing and implementing strategic plans, measuring & assessing performance, monitoring environmental influences, conducting needs assessments, and incorporating mission-oriented criteria into financial and human resources management are examples of the topics covered. (S,AY)
Restriction(s):
Can enroll if Level is Graduate

PAPP 582  Policy Analysis & Development  3 Credit Hours
We examine the role of information in policy development for the public and organizations paying particular attention to analytical strategies and tools, stages in the policy process where they can be incorporated, and strategic approaches for maximizing the likelihood of impact. (W,AY)
Restriction(s):
Can enroll if Level is Graduate

PAPP 583  Program Evaluation  3 Credit Hours
This class examines procedures for evaluating programs in public and nonprofit settings. The concern will be to examine the various techniques available to determine whether or not a program is doing what it was intended to do. (W,YR)
Restriction(s):
Can enroll if Level is Graduate

PAPP 584  Revitalizing Cities  3 Credit Hours
What have we done to address decline in city neighborhoods and downtowns? Why? How has it worked? Why? What's the hope for the future? This course uses a public policy lens to engage students in a request for answers to these questions. (YR)

PAPP 585  Performance  3 Credit Hours
Evaluating the performance of employees is crucial to the motivation of the individual and the success of the organization. Evaluating the performance of organizations helps leaders direct resources to areas where they can have the most impact. This class will consider the available methods for assessing individual and organizational performance in public and nonprofit settings. (S,AY)
Restriction(s):
Can enroll if Level is Graduate

PAPP 586  Ethics of Admin & Public Pol  3 Credit Hours
This course critically examines ethical issues encountered by public administrators and policymakers. It examines ethical considerations related to managing people and other organizational resources and designing and implementing public policy. It seeks to help students identify, understand, and deal effectively with the ethical dimensions of leadership in the public and nonprofit sectors. (FW)
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Can enroll if Level is Graduate

College of Business

Information

Accreditation
The College of Business’s graduate and undergraduate degree programs are accredited by AACSB-International, the Association to Advance Collegiate Schools of Business. AACSB-International is the premier accreditation agency for business schools.

Mission Statement
The vision of the College of Business is to build on the quality tradition of the Block "M" by being a thought leader, known for creating positive impact on the communities we serve, and for promoting a global perspective through active learning, relevant teaching, and influential research.

The mission of the College of Business is to offer a challenging and engaging business education that broadens our students' intellectual perspectives and career opportunities in an inclusive environment through a balanced emphasis on active learning, and rigorous and relevant teaching and research.

In accomplishing our mission, we are student-centered and value the importance of:

• practical and experiential learning
• personal connections among students, faculty, and staff
• leading-edge scholarship
• curricular innovation
• diverse students and programming, and
• industry and community partnerships.

Admission Policies and Process
The College of Business accepts graduate applications from those holding a bachelor degree or its equivalent from an accredited college or university. Students with all types of undergraduate and graduate degrees and fields of study are welcome to apply for admission.

Mathematics Admission Prerequisites
Quantitative skills are important and frequently used in graduate business courses. Applicants must demonstrate proficiency in mathematics by successful completion of courses through college algebra, finite mathematics, or pre-calculus, with the equivalent of a "C" grade or better. If an applicant’s university transcripts do not show satisfactory completion of college algebra, finite mathematics, pre-calculus, or higher-level math courses (e.g. calculus), the burden will be on the applicant to explain and document that the applicant has math knowledge equivalent to one of these courses.

The following UM-Dearborn courses will satisfy the mathematics admission requirement: MATH 104 College Algebra or MATH 105 Pre-calculus.

GMAT/GRE Admission Prerequisite
Applicants must submit official GMAT (Graduate Management Admission Test) or GRE (Graduate Records Examination) scores as a part of the evaluation for admission. Scores older than five years will not be considered. GMAT and GRE Verbal and Quantitative scores are heavily weighted in the admission decision. Applicants are encouraged to take the GMAT or GRE test at the earliest possible date and request that scores be reported to the University of Michigan-Dearborn. The GMAT (https://www.mba.com/) and GRE (https://www.ets.org/gre/) websites provide complete information about these tests.

Applicants may be eligible to receive a waiver of the GMAT/GRE admission requirement if they meet one of the following conditions:

• Have 3+ years of progressively-responsible, professional work experience and 3.2 (3.0 for MS applicants) cumulative or post-60 undergraduate GPA.
• Completed an undergraduate business or engineering degree from an AACSB- or ABET-accredited program within the previous 5 years with a 3.2 (3.0 for MS applicants) cumulative or post-60 GPA.
• Completed a graduate degree from a regionally accredited US-based institution, or an equivalent international degree.
• Passed all portions of any of the following certification exams: CAS, CFA, CFM, CMA, CPA, FRM, SOA, or a state bar exam.
• Are a member of the US armed services with 3+ years of service, or an honorably discharged veteran.
• Are a full-time, regular employee of the UM-system with a letter of recommendation from a supervisor or department/unit head who is familiar with your professional work.
• Completed an undergraduate degree from a program included in an articulation agreement with UM-Dearborn within the previous 5 years with a 3.2 (3.0 for MS applicants) cumulative or post-60 GPA (on a 4-point, US-equivalent scale).

If applicants believe they qualify to receive the GMAT/GRE waiver, they should indicate so in the appropriate section of the application for admission. The College of Business graduate admissions committee may require applicants to submit official GMAT or GRE scores even if those applicants meet one of the waiver conditions. The committee sometimes does this when additional information is necessary in order to reach an admission decision. Also, the admissions committee will consider any GMAT and GRE scores applicants submit to the University, regardless of whether the applicant qualifies to receive the waiver. If applicants have any questions about the GMAT/GRE waiver, they should contact the College of Business at umd-gradbusiness@umich.edu.

Work Experience
Work experience is not required for admission to the graduate programs in the College of Business. However, all applicants must submit a 1-2 page resume with their application materials listing education; any employment, internship, or similar types of experience; any professional affiliations, volunteer activities, or relevant honors and awards, together with the months and years of each activity. The resume is considered during the admission process.

References
At least one reference is required for admission. Applicants indicate who their reference(s) is (are) in the graduate application for admission, and those references will submit their evaluations directly to the University. The reference is typically a person who is familiar with the applicant’s academic accomplishments or job performance.

Bring-Your-Own Device and Presumption of Computer Application Skills
The College of Business requires graduate students to bring their own laptop computers to several courses, which are noted each semester in the College's graduate course schedules (https://umdearborn.edu/cob/graduate-programs/advising-and-registration/). We recommend all graduate students purchase a laptop computer (https://umdearborn.edu/cob/about/campus-facilities-and-technology/) according to the College's specifications.

In addition, the faculty expect each graduate student to be proficient in word processing and spreadsheets, including spreadsheet math and statistical functions. Before enrolling in College of Business graduate courses, students must have completed a college-level computer applications course, or they must have acquired equivalent expertise through training or work experience.

Transcripts
The admissions committee strongly considers applicants’ previous undergraduate and graduate transcripts in the admission evaluation. The evaluation includes grade point average (both the post-60 GPA and cumulative GPA), trends of grades, types and relative difficulty of courses taken, and evidence of quantitative and analytical skills.

Applicants must submit an official academic transcript from each college and university attended, including the University of Michigan-Dearborn, during the application process. To be considered official, transcripts cannot be accepted if sent by the student. When requesting transcripts from one of
the three University of Michigan campuses (UM-Ann Arbor, Dearborn, or Flint), inter-office copies are sufficient for admission consideration.

**Admission Criteria**

Students with all types of undergraduate and graduate degrees from all fields of study are welcome to apply for admission.

The College of Business conducts a holistic review of each application. There is no formula to define who will make a successful candidate, but the College is especially interested in strong academic performance, as evidenced on the applicants’ academic transcripts, and strong GMAT or GRE test scores. In addition, the College considers the statement of purpose, reference letter, and resume. Additional information about the admission process and criteria, including information about GMAT and GRE waivers, as well as profiles of the most recent entering class, can be found at umdearborn.edu/cob/grad-admissions (http://www.umdearborn.edu/cob/grad-admissions/).

**Taking UM-Dearborn Undergraduate Courses to Fullfill Admission Prerequisites**

Please check the registration system (https://umdearborn.edu/students/registration-records/registration/course-offerings/) for course availability each term. To register for admission prerequisite courses as a non-degree student (personal enrollment) before starting a College of Business graduate program, follow the instructions provided by the Undergraduate Admissions Office. Please note that personal enrollment students are not eligible for financial aid. For further information and guidance, please contact the College of Business at umd-gradbusiness@umich.edu or 313-593-5460.

Applicants deficient in one of the admission prerequisites may be considered for admission contingent upon their completing the appropriate course during their first term of enrollment in the graduate degree program.

**Application Deadlines, Fees, and Other Instructions**

The College of Business admits students in the fall (September), winter (January), and summer (May) terms. Applicants for full-time study should generally plan to enter in the fall or winter term; full-time admission is subject to course availability, especially during the summer term. Applications are reviewed on a rolling basis. Email notification is sent shortly after the admission decision. The application deadlines for domestic students are August 1 for fall admission, December 1 for winter admission, and April 1 for summer admission. Applications received after these deadlines are accepted on a space-available basis.

Full application instructions and fee information, including links to the Graduate Application, can be found at umdearborn.edu/admissions/graduate (https://umdearborn.edu/admissions/graduate/how-apply/).

All transcripts, credentials and other documents submitted during the admission process become the property of the University. Originals or copies of application/admission documents are not released to the applicant or to any third party.

**Deferred Admission**

Admission to a College of Business graduate program is valid for one year after the semester for which admission was granted. If an admitted applicant wishes to defer admission, written notification must be sent to the College of Business Graduate Office (umd-gradbusiness@umich.edu) before the start of the semester for which initial admission was granted.

Students must meet admission and degree requirements in effect during the new semester of entry.

**International Students**

The College of Business welcomes applications from qualified international students.

**Housing**

Students should refer to the following website for housing information at umdearborn.edu/campus-life/housing (https://umdearborn.edu/campus-life/housing/).

**Costs**

Each international student or his/her sponsor(s) must submit a notarized Affidavit of Support. This form must indicate that the student has access to funds, including living expenses, equaling an amount stipulated by the Office of International Affairs. Refer to umdearborn.edu/international (http://www.umdearborn.edu/international/).

**Transcripts**

In addition to the instructions for domestic applicants, international applicants must also provide:

- Official documentation of all courses taken and grades received (transcripts/records) from each undergraduate and postgraduate institution attended. Transcripts/records should be issued in the original language and be accompanied by English translations prepared by the institution’s authorized official, such as a registrar.
- Official certification of degrees and dates awarded, issued in the original language and accompanied by English translations prepared by the institution’s authorized official, such as a registrar. Academic transcripts/records must have a seal and signature in ink from the institution’s authorized official, such as a registrar or recorder.

All credentials and documents submitted become the property of the University.

**Applications**

In addition to the instructions for domestic applicants, international applicants must follow special application instructions for international students (https://umdearborn.edu/cob/graduate-programs/admission/international-admission/), including:

- Submit the Affidavit of Financial Support for International Students with supporting documentation. Recommendation for admission cannot be certified without this information.
- Submit official transcripts from all universities attended.
- Meet the minimum standards of the English proficiency requirement by taking either the TOEFL, IELTS, or the MELAB and submitting scores to the University.
- International students requiring an I-20 upon admission to the College must have a complete application file and the application fee must be paid by May 1 for fall admission, September 1 for winter admission, and January 1 for summer admission.

**English Language Requirements**

Since all instruction at the University is in English, international students must demonstrate proficiency in English comprehension, writing, grammar, and vocabulary.
The College of Business requires the following minimum test score requirements on one of the following tests for admission consideration:

- Internet Based Test TOEFL (http://www.toefl.org): 84
- Paper-Pencil TOEFL (http://catalog.umich.edu/graduate/college-business/toefl.org): 560
- Computer-Based TOEFL (http://catalog.umich.edu/graduate/college-business/toefl.org): 220
- IELTS (http://catalog.umich.edu/graduate/college-business/ielts.org): 6.5
- MELAB (http://catalog.umich.edu/graduate/college-business/lsa.umich.edu/eli/): 80

The College of Business does not offer conditional admission while students practice their English skills; however, the University of Michigan-Dearborn does offer several intensive English language courses through its English Language Proficiency Program (https://umdearborn.edu/offices/international-affairs/english-language-proficiency-program/elpp-admission/).

**Guest Students and Post-Graduate Students**

Students currently enrolled in a graduate program at another university (guest students), as well as students who have already earned a graduate degree (post-graduate students), may request permission to enroll in College of Business graduate courses as guest students. Guest and post-graduate registration is allowed on a space-available basis, usually on or shortly after the first day each semester’s courses begin. Prospective guest students should review the College of Business graduate course descriptions (https://umdearborn.edu/cob/graduate-programs/advising-and-registration/), paying particular attention to prerequisites, to determine which course(s) they wish to take. Prospective guest students must then:

- Complete the UM-Dearborn graduate guest application (https://umdearborn.edu/cob/graduate-programs/admission/guest-student-admission/) and application fee; the application and application fee is valid for one semester. When a guest or post-graduate student requests enrollment for two consecutive terms at the time of initial application, the application fee will be waived for the second term of enrollment. The second term of enrollment is contingent on earning a grade of B or better in each course elected at UM-Dearborn.
- Have official transcripts sent directly to the College of Business Graduate Office from the student’s undergraduate degree-granting institution, as well as any official transcripts for graduate coursework completed or in progress.
- Provide written permission from their current graduate institution verifying enrollment in a graduate program and granting permission to elect the course(s) at the University of Michigan-Dearborn.

The College of Business Graduate Office will review the previous documentation. If approved for guest admission, the College will contact the student with appropriate procedures for course registration. Guest and post-graduate students are allowed to elect a maximum of nine semester hours of credit. Credits earned as a guest or post-graduate student do not count as credit toward degree in the College of Business. Graduate guest business students may contact umdgradbusiness@umich.edu or 313-593-5460 for additional information.

**Academic Policies and Courses**

**Graduate Internship Program**

The Internship program is an optional academic program that integrates classroom work and practical experience with cooperating businesses. Up to three non-resident academic credits are granted for the internship. Second and third internships will be offered for additive credit only. A maximum of 3 credit hours of internship course work from BI 500, BI 505 or BI 560 may be applied toward graduation requirements upon approval from the College of Business graduate office.

Students interested in Graduate Internships should schedule an appointment with the Internship and Career Management Center (ICMC) to go over program policies. The ICMC coordinates resume dissemination, interview scheduling and job offers.

Students must register for the internship before starting work. As part of the internship, students are required to write a report at the end of the semester and participate in the evaluation process. Students may elect two courses along with the internship with the permission of the Internship Director.

Master of Science in Accounting students do not need to have completed 6 credit hours and can apply for an internship in their first term of entry.

**Course Descriptions**

The courses described here are those regularly offered by the College. All courses give three hours of credit, except as otherwise specified by the numeral(s) in parentheses. Check with your Graduate Program Advisor at umd-cobgradadvisor@umich.edu for applicability of course offerings to your degree program. Students are strongly encouraged to plan their program by using the Course Reference Guide (https://umdearborn.edu/cob/graduate-programs/advising-and-registration/) and working with their academic adviser.

Students enrolled in graduate degree programs from other UM-Dearborn colleges may not elect more than 12 graduate credits offered by the College of Business, unless the College of Business credits are required as part of the student’s graduate degree program.

**Course Prerequisites**

The faculty determine the appropriate prerequisites for each course. Course prerequisites help ensure each student has the specific knowledge necessary to complete and fully participate in each course. Students must observe all course prerequisites. The registration system will not allow students to register for courses without the course prerequisites successfully completed. Students with previous coursework or experience may petition the College of Business for a course prerequisite override (https://umdearborn.edu/students/academic-advise/student-petitions/). (In order to allow time for faculty to review the petition, you must allow 10 business days for your request to be reviewed.) In some cases, students may be asked to supply additional information to support the request.

Students who have registered for a course without the prerequisites or an approved override will be withdrawn from the course.

**Course Waivers and Exemptions**

Course waivers, where available, reduce the number of credits required to complete a degree. Exemptions, where available, must be replaced with other advisor- or department-approved, graduate-level coursework, as noted in the College of Business degree program descriptions. The College of Business Graduate Program Office, in consultation with the
faculty and academic department chairs, determines all course waivers and exemptions at the time of admission. Waivers and exemptions are based on previous equivalent undergraduate or graduate coursework as reflected on official transcripts. Students may enroll in courses that have been waived or exempted, although completion of waived courses will result in the loss of the respective course waiver. Once admitted to a graduate program in the College of Business, students must take graduate level courses or courses approved for graduate credit.

Admitted applicants may request a course waiver or exemption by completing an Academic Petition Form (https://umdearborn.edu/cob/graduate-programs/advising-and-registration/). The following supporting documentation must accompany the petition: copy of the course description from the college catalog, a copy of the course syllabus, and a copy of the title page and table of contents of the textbook used in the course.

Minimum Credits in Residence
A maximum total of twelve (12) graduate credits may be applied to any College of Business graduate degree from any combination of:

- Approved graduate level offerings (500-level and above) offered by another UM-Dearborn academic unit: maximum three (3) credits.
- Graduate transfer credit from an AACSB-accredited program: maximum six (6) credits.
- Graduate Business Internships (BI 500 or BI 505 or BI 560): maximum three (3) credits.
- College of Business graduate credits earned through exchanges with international partner universities: maximum twelve (12) credits.

Transfer Credit
A maximum of six (6) graduate semester credits may be transferred to a student's academic record. Transfer credits appear on the UM-Dearborn transcript, but the associated grades received for these credits do not appear and are not computed in the student’s cumulative GPA. Credits may be transferred only for approved graduate-level courses if the following conditions are met:

- The student must submit an Academic Petition Form (https://umdearborn.edu/students/academic-advising/student-petitions/) requesting transfer credit with the following documentation attached: a description of the course from the college or university catalog, the course syllabus, and, if requested, a copy of the title page and table of contents for each textbook used. Usually, the course must have been completed in an AACSB-accredited business program. The petition is then reviewed by the appropriate faculty member, department chairperson, and Graduate Program Director.
- The student must direct the institution offering the course to send an official transcript showing the course and final course grade, if final, official transcripts were unavailable at the time of admission.

Courses may not be transferred for credit if:

- They were already applied toward a degree or certificate; or
- They were completed more than five years before enrollment in the College of Business graduate program; or
- The earned course grade was lower than a B.

Grade Requirements and Academic Standing
A cumulative average grade of B (3.0) or higher is required in all graduate courses taken for credit and applied to the credit hour requirements. No credit toward degree requirements is granted for courses in which grades below C- are received. Courses elected under the pass-fail option are not considered in computing grade average.

To be in good academic standing, a student must have an overall grade point average of 3.0 or better on a 4.0 scale. At the end of each term, the College of Business reviews the standing of each student with a scholastic average below 3.0. Those whose grade point average for the term falls below 3.0 will receive a warning regardless of the cumulative average.

If a student’s cumulative GPA is below a 3.0 upon reaching a total of 6 credit hours, or at any point thereafter, the student will be placed on academic probation. Students on academic probation are required to meet with their academic adviser. The student will be allowed to continue on probation as long as the student is making progress toward degree and earning above a 3.0 term GPA. Students not progressing toward degree will be required to withdraw from the program. Students required to withdraw may petition to be readmitted.

Repeating Courses
College of Business graduate students may repeat courses in which they receive a grade of C+ or lower. Grades and honor points for the original course and the repeated course both appear on the student’s transcript, and both are used in computing the student’s grade point average. However, additional credit toward program will not be awarded for repeated courses in which the original grade was C+, C, or C-. College of Business graduate students may not repeat courses in which they have received grades of B- or higher. Students should check with their academic adviser to verify specific program grading policies.

Pass-Fail Option
Graduate students enrolled in the College of Business may elect courses with the pass-fail grading option, subject to the following conditions. Courses elected on a pass-fail basis outside of these parameters will not count toward degree requirements:

- Students on academic probation may not elect courses as pass-fail.
- Courses to be taken under this option must be specified at the time of registration or within the regular period for adding courses.
- Required MBA Core, Applied Integrated Management (AIM), and Concentration courses may not be elected pass-fail. Only general elective courses not used toward one of these other categories may be taken pass-fail. Courses used to satisfy any degree requirements in the MS in Accounting, MS-Business Analytics, MS-Finance, MS-Information Systems, MS-Marketing, and MS-Supply Chain Management may not be elected pass-fail.
- In a course offered with a pass-fail option, a reported grade of 6- or above will be recorded as F, and a reported grade of below B- will be recorded as F. (Whether a P or F is recorded, the grade is not used in computing a student’s grade point average.)
- In a course offered exclusively on a pass-fail basis, a passing grade will be recorded as S (and not used in computing a student’s grade point average), and a failing grade will be recorded as E (and used in computing grade point average).
- A student may elect at most two courses (6 credit hours) on a pass-fail basis, whether at the student’s option or not (excluding internship courses).

Time-Limits for Enrollment and Degree Completion
Admission to the College of Business is granted for a specific term. Students who are admitted but do not enroll in the appointed term, and
who have not notified the College of their desire to defer admission, must reapply for admission. Full-time or part-time students lose active degree candidacy if they do not complete at least one course within each 12-month period. Readmitted students must comply with current degree requirements at the time of readmission. Admission to the College is competitive, and applications for readmission will be decided on the standard for the term in which the former student wishes to enroll.

Requirements for the degree must be completed within seven (7) years of first enrollment. Students who desire more time must submit, in a written petition to the College of Business Academic Standards Committee, reasons for the request and specific plans for the completion of the degree program.

**Petitions for Academic Action**

Each request to the faculty of the College of Business for special academic action, including credits, requirements, academic standing, and other matters, should be entered on the Academic Petition Form (https://umdearborn.edu/students/academic-advising/student-petitions/) for review by the faculty serving on the Academic Standards Committee. A written response, indicating the Committee’s decision or action, will be sent to the student’s UM-Dearborn email account.

**Master’s Degree Programs**

The College of Business offers the following master’s degree programs, each accredited by AACSB-International. Programs indicated with an asterisk (*) are offered as evening programs. Programs indicated with a plus (+) also have an online option.

- Accounting (MSA) (p. 879)*
- Business Administration (MBA) (p. 884)+
- Business Analytics (MS) (p. 887)*
- Finance (MSF) (p. 909)+
- Information Systems (MS) (p. 912)*
- Marketing (MS) (p. 916)*
- Supply Chain Management (MS) (p. 917)*

**Dual-Degree Options**

- Master of Business Administration (MBA) and Master of Science in Finance (MS) (p. 888)+
- Master of Business Administration (MBA) and Master of Science in Information Systems (MS) (p. 892)*
- Master of Business Administration (MBA) and Master of Science in Supply Chain Management (MS) (p. 896)*
- Master of Science in Accounting (MSA) and Master of Science in Finance (MSF) (p. 898)*
- Master of Business Administration (MBA) and Master of Science in Engineering in Industrial and Systems Engineering (MSE) (p. 904)+
- Master of Business Administration (MBA) and Master of Health Services Administration (MHSA) (p. 907)*

**Administration**

N. Raju Balakrishnan, PhD, Dean
Karen S. Strandholm, PhD, Associate Dean
Tim Davis, MBA, Assistant Dean

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**Chairs and Directors**

Michael Kamen, Academic Program Director, Graduate Programs
Lee Redding, Chair, Associate Professor, Accounting and Finance
Crystal Scott, Chair, Associate Professor, Management Studies
Susan Wells, Academic Program Director, Undergraduate Programs

**Professors Emeriti**

Bayou, Mohamed E., PhD, Professor Emeritus of Accounting
Iatz Jr., Robert, JD, LLM, Professor Emeritus of Taxation
Bublitz, Bruce, PhD, Professor Emeritus of Accounting
Callahan, Thomas J., PhD, Associate Professor Emeritus of Organizational Behavior
Chou, Yu-Min, PhD, Professor Emeritus of Business Economics and Finance
Cowan, Ross D., MF, Associate Professor Emeritus of Operations Management
Foran, Michael, PhD, Professor Emeritus of Accounting
Fricke, Cedric V., PhD, Professor Emeritus of Business Administration
Lev, Benjamin, PhD, Professor Emeritus of Operations Research
Lyons, Thomas F., PhD, Professor Emeritus of Business Administration
Martin, William R.D., MBA, Professor Emeritus of Business Administration
Steel, Robert, PhD, Professor Emeritus of Organizational Behavior
Streeter, Victor J., PhD, Associate Professor Emeritus of Management Information Systems
Waissi, Gary, PhD, Professor Emeritus of Operations Research

**Faculty**

**Department of Accounting and Finance**

Baker, Susan, MBA, University of Michigan, Lecturer
Cai, Kelly N., PhD, University of Houston, Professor
Graybeal, Patty, PhD, Virginia Tech University, Lecturer
Green, Brian P., PhD, CPA, Kent State University, Professor
Hayes, Matthew, PhD, Arizona State University, Assistant Professor
Jin, Shunyao (Cynthia), PhD, Michigan State University, Assistant Professor
Kent, Richard, PhD, University of Queensland, Assistant Professor
Killey, Michael N., PhD, Florida Atlantic University, Assistant Professor
Kobelsky, Kevin, PhD, University of California, Associate Professor
Kocher, Claudia, PhD, Michigan State University, Associate Professor
Lee, Hei Wai, PhD, University of Illinois at Urbana-Champaign, Professor
Miranda, Maria (Mercedes), PhD, University of New Orleans, Lecturer
Philipich, Kirk, DBA, Indiana University, Associate Professor
Redding, Lee, PhD, Princeton University, Associate Professor
Singh, Vivek, PhD, Virginia Technological University, Professor
Valero, Magali, PhD, Arizona State University, Associate Professor
Vlisides, Nicholas, MBA, Wayne State University, Lecturer
Xie, Alice, PhD, Syracuse University, Associate Professor

Department of Management Studies
Ahuvia, Aaron, PhD, Northwestern University, Professor
Ames, Justin, PhD, Case Western Reserve University, Assistant Professor
Balakrishnan, N., Raju, PhD, Purdue University, Professor
Beatty, Joy, PhD, Boston College, Associate Professor
Cao, Yinyin, PhD, University of Pittsburgh, Assistant Professor
Chandra, Charu, PhD, Arizona State University, Professor
Chen, Yi-Su, PhD, Boston College, Associate Professor
Deska, Thomas, MA, Michigan State University, Lecturer
Fischer, Christine, MA, Eastern Michigan University, Lecturer
Freeman, Lee, PhD, Indiana University, Associate Professor
Fu, Wayne, PhD, Georgia Institute of Technology, Assistant Professor
Guo, Yi (Maggie), PhD, Texas A M, Associate Professor
Harris, Marcus, DBA, Lawrence Technological University, Lecturer
Hartge, Timothy, MA, University of Michigan, Lecturer
He, Jun, PhD, University of Pittsburgh, Associate Professor
Holowicki, Gerald, MS, Eastern Michigan University, Lecturer
Izberk-Bilgin, Elif, PhD, University of Illinois at Chicago, Associate Professor
Kao, Ta-Wei (Daniel), PhD, State University of New York at Buffalo, Assistant Professor
Kaufman, David, PhD, University of Michigan, Assistant Professor
Keys, Patrick, MBA, Central Michigan University, Lecturer
Klein, Barbara D., PhD, University of Minnesota, Professor
Kumar, Kamalesh, PhD, University of North Texas, Professor
Lee, Cindy, MS, University of Virginia, Associate Professor
Lee, Junghyun (Jessie), PhD, George Washington University, Associate Professor
Lee, Kyungwon, PhD, Rutgers University, Assistant Professor
Liu, Zhixin (Jason), PhD, Ohio State University, Associate Professor
Majeske, Katherine, MBA, University of Michigan, Lecturer
Molloy, Janice, PhD, Ohio State University, Associate Professor
Ro, Young, PhD, University of Michigan, Professor
Samfilippo, Chris, MBA, Wayne State University, Lecturer
Scott, Crystal, PhD, Pennsylvania State University, Associate Professor
Smrt, Diana, PhD, Southern Illinois University, Lecturer
Statt, Anne-Louise, PhD, Princeton University, Lecturer
Strandholm, Karen S., PhD, JD, Indiana University, Associate Professor
Su, Hung-Chung, PhD, University of Minnesota, Associate Professor
Urbaczewski, Lise, MS, Eastern Michigan University, Lecturer
Van Hemert, Michael, JD, University of Michigan, Lecturer
Wang, Dawei (David), PhD, University of Oklahoma, Assistant Professor

Education. Membership in Beta Gamma Sigma is one of the highest scholastic honors that a graduate business student can achieve based on outstanding scholastic achievement as measured by overall grade point average. Invitation for membership to Beta Gamma Sigma is extended to College of Business students that are in the top twenty percent of their graduation class.

Graduation with Distinction
Students who have maintained a 3.70-3.89 cumulative grade point average will graduate "With Distinction," and it will be recorded on their transcript.

Graduation with High Distinction
Students who have maintained a 3.90 or above cumulative grade point average will graduate "With High Distinction," and it will be recorded on their transcript.

Accounting
The Master of Science in Accounting provides specialized training for successful careers in corporate accounting, controllership, and public accounting.

Students in the MS in Accounting at UM-Dearborn can complete the CPA exam preparation (https://umdearborn.edu/cob/undergraduate-programs/majors-minors-curriculum/professional-certifications/cpa-exam-preparation/) course through CPAexcel® at a significant discount, and even qualify to receive a 100% reimbursement. The MS in Accounting is open to students from all undergraduate majors and does not require previous accounting coursework.

The program is offered on campus, and a few of the courses are also occasionally available on-line. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer. The program usually can be completed within 12-16 months of full-time study.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

Students eligible to pursue the Accounting 4+1 option (https://umdearborn.edu/cob/graduate-programs/degree-programs/ms-accounting/accounting-41-option/) may count 4 courses/12 credits in the graduate program toward their undergraduate accounting major. All other University of Michigan-Dearborn students who have been admitted to the MS in Accounting may take up to 6 graduate credits during the final semester of their undergraduate program.

MS in Accounting Program Goals and Objectives
Goal: MS in Accounting students will be able to integrate theory and applications in a variety of business situations.

Objectives: MS in Accounting students will:
- Effectively communicate ideas orally, in writing, and using computer technologies.
- Integrate multiple sources of information to formulate solutions to complex business issues.

Academic Honors
Achievement of various kinds is recognized both prior to graduation and in the granting of degrees.

Dean's Honor Roll
Each fall and winter term the dean posts an honor roll recognizing those students who have taken nine hours or more, and have obtained a B+ (3.3) or better average.

Beta Gama Sigma
Beta Gamma Sigma is the national honor society for business schools accredited by AACSB-The International Association for Management
• Analyze standards and regulations that affect multinational businesses.
• Apply the professional standards of practice to business situations.

MS in Accounting Admission
Prerequisites
• Mathematics admission prerequisite
• GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver

MS in Accounting Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>3</td>
</tr>
<tr>
<td>ACC 514</td>
<td>Financial Reporting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 516</td>
<td>Advanced Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 555</td>
<td>Cost Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 557</td>
<td>Auditing</td>
<td>1</td>
</tr>
<tr>
<td>ACC 560</td>
<td>Intro Federal Income Taxation</td>
<td>3</td>
</tr>
<tr>
<td>ACC 580</td>
<td>Accounting Information Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives
Select three courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 539</td>
<td>Not-for-Profit Accounting</td>
<td>1, 2</td>
</tr>
<tr>
<td>ACC 601</td>
<td>Information Tech Auditing</td>
<td>2</td>
</tr>
<tr>
<td>ACC 603</td>
<td>Controllership</td>
<td>2</td>
</tr>
<tr>
<td>ACC 604</td>
<td>Auditing&amp;Forensic Examination</td>
<td>3</td>
</tr>
<tr>
<td>ACC 605</td>
<td>International Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 608</td>
<td>Financial Statement Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ACC 614</td>
<td>Advanced Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 657</td>
<td>Adv Auditing &amp; Assurance Serv</td>
<td>2</td>
</tr>
<tr>
<td>ACC 660</td>
<td>Advanced Federal Income Tax</td>
<td>2</td>
</tr>
<tr>
<td>LE 510</td>
<td>Commercial Transactions</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Credit Hours: 30

1 Simultaneous credit toward the BBA Accounting major and MSA for students admitted to the Accounting 4+1 option.
2 Recommended for students who intend to take the CPA exam.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions and transfer credit are granted at the discretion of the program faculty.

Dual Degree, MS in Accounting/MS in Finance

The MS in Accounting/MS in Finance dual degree program combines specialized training for careers in corporate accounting, controllership, and public accounting with specialized training required for success in the financial professions. Students select either the corporate finance or the investments concentration in the MS-Finance. Students in the program can qualify to receive a 100% reimbursement of the cost of completing CPA exam preparation through CPAexcel®. The program is open to students with strong quantitative and analytical skills, regardless of their undergraduate major.

The program allows students to receive both the MS in Accounting and the MS in Finance simultaneously upon completion of 51-54 credit hours, depending on which MSF concentration is selected.

Students may enroll on a full- or part-time basis. All courses in the program are offered on campus; many are also available on-line. Course offerings are greatest during the fall and winter semesters, and the program usually can be completed within 12 months of full-time study.

Admission is rolling, and students may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the program may take up to 6 graduate credits during the final semester of their undergraduate program. Students must successfully complete their undergraduate degree before taking any additional graduate-level courses.

MS in Accounting/MS in Finance Curriculum

MSF Foundation Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>3</td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
</tr>
</tbody>
</table>

MSF Concentration

Select one of the following MSF concentrations:

18-21

MSF Corporate Finance

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 650</td>
<td>Corporate Valuation &amp; Strategy</td>
<td>3</td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td>3</td>
</tr>
</tbody>
</table>

MSF Accounting Electives: 6
Select two of the following:  
- ACC 514 Financial Reporting  
- ACC 516 Advanced Accounting  
- ACC 555 Cost Management  
- ACC 560 Intro Federal Income Taxation  
- ACC 601 Information Tech Auditing  
- ACC 603 Controllership  
- ACC 608 Financial Statement Analysis  
- ACC 660 Advanced Federal Income Tax  

**MSF General Electives:**
Select two of the following:  
- BE 583 Global Econ: Crisis & Growth  
- FIN 651 Invstmnt Proc, Analysis & Mgmt  
- FIN 654 Financial Intermediation  
- FIN 655 International Financial Mgt  
- FIN 657 Investment Fund Management  
- BA 690 Graduate Research  
- BI 500 Business Internship  
At most one of the following:  
- DS 630 Applied Forecasting  
- DS 631 Decision Analysis  
- DS 632 System Simulation  

**MSF Investments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSF Required:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACC 608</td>
<td>Financial Statement Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FIN 651</td>
<td>Invstmnt Proc, Analysis &amp; Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 653</td>
<td>Topics/Investments &amp; Cap Mkts</td>
<td>3</td>
</tr>
<tr>
<td><strong>MSF Electives:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select two of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
<td>3</td>
</tr>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 654</td>
<td>Financial Intermediation</td>
<td>3</td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td>3</td>
</tr>
<tr>
<td>FIN 656</td>
<td>Fixed Income Securities</td>
<td>3</td>
</tr>
<tr>
<td>FIN 657</td>
<td>Investment Fund Management</td>
<td>3</td>
</tr>
<tr>
<td>BA 690</td>
<td>Graduate Research</td>
<td>3</td>
</tr>
<tr>
<td>BI 500</td>
<td>Business Internship</td>
<td>3</td>
</tr>
</tbody>
</table>
At most one of the following:  
- DS 630 Applied Forecasting  
- DS 631 Decision Analysis  
- DS 632 System Simulation  

**General MSF Requirement**
Complete at least 15 BE and FIN credits, excluding BE 530 and FIN 531.

**MSF Foundation Course Exemptions**
Previous equivalent undergraduate or graduate coursework may qualify students to exempt any of the foundation courses. Students must replace exempt MSF foundation courses with additional courses within their MSF concentration.

**MSA Core Course Exemptions**
Previous equivalent undergraduate or graduate coursework may qualify students to exempt any of the core courses. Exempt core courses are replaced with additional MSA electives.

Previous coursework deemed substantially similar to BE 530, DS 520 or FIN 531 may qualify to exempt students from these MSF foundation courses. Students must replace exempt MSF foundation courses with additional courses within their MSF concentration.

Regardless of exemption credits granted, students must earn at least 51 credits in the dual-degree program if completing the MSF Corporate Finance concentration, or at least 54 credits if completing the MSF Investments concentration.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions and transfer credit are granted at the discretion of the program faculty.
ACC 505  Devel & Interp Financial Info  3 Credit Hours
Students learn how financial information is developed, interpreted and utilized in business. This is accomplished by studying financial accounting tools and estimation methods used for interpretation and managers? decisions relating to investing, financing, and operating activities. Topics include financial information development and analysis, accounting estimation techniques, and cash flow analysis. Financial accounting methodology with respect to the sales and receivables cycle, inventory, property, plant and equipment, liabilities, corporate equity and initial public offerings, and investments in other corporate entities are studied. Cases requiring critical analysis and interpretation may be integrated throughout the course.

Restriction(s):
Can enroll if Class is Graduate

ACC 514  Financial Reporting  3 Credit Hours
This course covers detailed financial statements, the theoretical foundations behind those statements and how the various transactions are reported on those statements. These transactions include financing through various ownership and debt instruments, off-balance-sheet financing and leverage; investing in tangible and intangible operating assets; investing in financial instruments for return and risk management purposes; and investing in financial instruments to influence or control operations of other business units. Specifically, the course will review the accounting process and examine in detail the Income Statement, Balance Sheet and Statement of Cash flows including a study of the basics of revenue recognition, a detailed study of accounting for inventory, accounting for the life cycle of capital investments in non-current assets, various debt topics such as short term loans and payroll, as well as how companies account for long term debt and equity changes. These operating, financing and investing issues will be considered based on today's international business environment. (OC)

Prerequisite(s): ACC 505 or ACC 298

Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 516  Advanced Accounting  3 Credit Hours
To study selected advanced accounting topics which may include partnerships, business combinations, consolidated financial statements, multinational accounting and reporting, accounting for financial distress situations and regulation of accounting by the SEC. Students will not receive credit for both ACC 416 and ACC 516.

Prerequisite(s): ACC 357 or ACC 514

Restriction(s):
Can enroll if Program is MSA-Accounting

ACC 520  Comm for Acct and Tax Prof  3 Credit Hours
The ability to communicate effectively is an important skill for the tax professional. This course develops this important skill in tax compliance and tax planning settings through a series of case studies. Emphasis will be placed on effectively communicating technical aspects of the tax law to management, clients, and other professional tax situations. Students cannot receive credit for both ACC 630 and ACC 520.

Prerequisite(s): ACC 360

Restriction(s):
Can enroll if Class is Graduate

ACC 539  Not-for-Profit Accounting  3 Credit Hours
To study the principles and procedures of accounting for not-for-profit entities. Topics may include: state and local government financial accounting, financial accounting for selected other entities, managerial concepts and current issues. Student will not receive credit for both ACC 439 and ACC 539.

Prerequisite(s): ACC 356 or ACC 505

Restriction(s):
Can enroll if Program is MSA-Accounting

ACC 555  Cost Management  3 Credit Hours
To introduce how cost and managerial accounting concepts and techniques can be applied to fully utilize information created by contemporary accounting information systems. The theoretical and empirical nature of cost management reports, their structures and contents, are emphasized with the goal of highlighting the relevance and limitations of this information in decision making. The course gives consideration to global and individual responsibility center performance by covering such topics as product costing, control standards, cost allocation, pricing, quality, short-term and long-term budgeting, and performance evaluation. In addition, the reciprocal roles of accounting and technology in enhancing efficiency and effectiveness benchmarks are investigated. Interwoven into course coverage are ethical, diversity, critical thinking, and global dimensions of business. This course also integrates emerging issues and techniques to assist managers and consultants in the accounting, finance, marketing, and human resources arenas.

Prerequisite(s): ACC 505

Restriction(s):
Can enroll if Class is Graduate

ACC 557  Auditing  3 Credit Hours
To study generally accepted auditing standards, internal control, principal audit objectives, the structure of audit programs, audit procedures, professional legal liability, ethical standards, statistical sampling techniques, the audit of EDP systems, auditors report and management letters. (OC)

Prerequisite(s): ACC 505 or ACC 298

Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 560  Intro Federal Income Taxation  3 Credit Hours
Full Title: Introduction to Federal Income Taxation Survey analysis of the basic framework utilized in measuring and reporting taxable income of individuals and business entities including gross income, deductions, tax rates, credits, timing issues and procedural matters. (OC)

Prerequisite(s): ACC 505 or ACC 298

Restriction(s):
Can enroll if Level is Rackham or Graduate
ACC 580  Accounting Information Systems  3 Credit Hours
Accounting uses techniques to take raw data and convert it into information that is useful to managers and investors. But is it possible to convert data into information without knowing what it relates to, where and how it was gathered and what its limitations are? We will address these questions as we study accounting information systems. To begin, we focus on how data for typical business processes is captured and processed in a computerized accounting system using relational databases. We'll then learn how to describe an organization's accounting-related processes in a professionally rigorous way via documentation using tools used in the profession. We'll finish by learning how to analyze accounting processes to find control weaknesses in them that might allow them to generate unreliable data that could compromise the assets or liabilities of the firm or the decisions made by accountants, the managers they support or investors. (OC)
Prerequisite(s): ACC 505 or ACC 298
Restriction(s):
Can enroll if Class is Rackham or Graduate

ACC 600  Financial Accounting Theory  3 Credit Hours
This course provides an overview of 1) various approaches to accounting theory formulation (including traditional, regulatory, events, behavioral, information processing, predictive, and positive approaches), and 2) alternative asset valuation and income determination models (including historical cost, replacement cost, net realizable value, and present value models, along with the impacts of price level adjustments). Particular attention is directed at how these various approaches impact the state of the art of Accounting and how they influence the future evolution of Accounting. Additionally, the course provides for exploration and critical examination of the evolution and present state of the Financial Accounting Standards Board conceptual framework. The nature of the topics covered will enhance understanding of current and developing generally accepted accounting principles.
Prerequisite(s): ACC 356
Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 601  Information Tech Auditing  3 Credit Hours
With the increased capabilities of IT have come new risks for firms and or their auditors. Audit firms are finding that they can no longer audit ‘around the computer’. This requires CPAs to understand the types of risk arising in IT-based systems and consider their impact on a clients’ business and the audit. This course introduces you to these types of risk, the implications these risks have for the traditional audit and the other services public accountants provide to address IT-based risks. IT is also a powerful tool that accountants and auditors must know how to harness. Students will become proficient in applying commonly used electronic audit tools to conduct computer-assisted audit techniques (CAATs).
Prerequisite(s): ACC 505 or ISM 525 or CIS 564
Restriction(s):
Can enroll if Class is Graduate

ACC 602  Contemporary Accounting Issues  3 Credit Hours
This course provides in-depth exposure to emerging contemporary issues in accounting. Topics in the seminar change to reflect the most relevant professional issues. The issues chosen are designed to be not only timely but to also provide insight into emerging future areas of the profession. In addition to lecture material and readings, the lecturer may incorporate case material, research papers, and other teaching methods as appropriate.
Prerequisite(s): ACC 600 and ACC 601

ACC 603  Controllership  3 Credit Hours
The nature of the control function in business corporations is the focus of this course. Thus, classes cover the characteristics of management planning and control in functional and divisional organizations, responsibility accounting and the role of efficiency and effectiveness in performance measurement. Coverage also extends to controllers' roles in strategic planning, programming, and budgeting, transfer pricing, and their behavioral, global, ethical, and technological dimensions. Class presentations employ case analysis and emphasize the qualitative nature of controllership.
Prerequisite(s): ACC 355 or ACC 555
Restriction(s):
Can enroll if Class is Graduate

ACC 604  Auditing & Forensic Examination  3 Credit Hours
To study forensic examination and investigation techniques including typical embezzlement and financial statement fraud scenarios, fraud risk factors, sources and uses of evidence, and interrogation and surveillance techniques. Other course topics may include auditing standards for private and public companies, expanding assurance services, advanced internal control testing, audit objectives and procedures, ethical standards, sampling techniques, auditor's report, risk based auditing, and management letters. Special attention will be given to the changing role and services offered by internal and external auditors, auditor responsibility to the public, and the ability of the auditor to offer assurance. Prerequisites: Graduate standing.
Prerequisite(s): ACC 457 or ACC 557

ACC 605  International Accounting  3 Credit Hours
To study selected topics in international accounting and taxation. The course will examine accounting principles and practices of the major world economies and consider issues typically encountered by U.S. corporations in accounting for and reporting the financial activities of foreign operations. Students will explore taxation of international operations and tax planning for the U.S. based multinational corporation.
Prerequisite(s): ACC 608 or ACC 356 or ACC 357 or ACC 358

ACC 608  Financial Statement Analysis  3 Credit Hours
The objective of financial statement analysis is to examine the relationship between financial statement information and the measurement of firm value. The analysis merges actual firm value created by economic process and estimating firm value through accounting reporting methods. Students will develop tools to interpret financial statement information for use by investors, creditors, and other third party stakeholders. Topics include, but are not limited to, an overview of financial statements, basic financial analysis, profitability analysis and the quality of earnings, cash flow analysis, asset analysis, liability analysis, and valuation and equity analysis.
Prerequisite(s): ACC 505 and (FIN 531* or FIN 401*)
Restriction(s):
Can enroll if Class is Graduate
**ACC 614 Advanced Accounting II 3 Credit Hours**
This course is intended to help students gain expertise in preparing financial statements for complex business organizations. Specific topics include: The preparation of segmental and consolidated financial statements. Intricate accounting issues associated with business combinations including but not limited to combinations at the date of acquisition and periods post acquisition. Analysis of inter-company transactions such as inventory and asset transfers between parent and subsidiary. Reporting for segments of a business as well as interim reporting. Reporting foreign exchange issues including inter-period reporting and financial statement translation. Analysis of firm issues related to SEC reporting, re-organization, bankruptcy and troubled debt restructuring. Understanding of issues associated with fair-value reporting. International reporting issues associated with all of the above, as well as other, topics. (OC)

**Prerequisite(s):** ACC 416 or ACC 516

**Restriction(s):**
Can enroll if Level is Rackham or Graduate

**ACC 616 Corp Acts & Reacts & Firm Val 3 Credit Hours**
This course will analyze various decisions made by the firm relating to its operations as well as environmental impacts on its operations. This analysis will focus on the interpretation or translation of these decisions and environmental impacts by the two main providers of estimates of the firm’s economic value, its own financial statements and the stock market. The primary objective of this course is to illustrate how quickly, or slowly, firm decisions and environmental impacts are impounded into these estimates of firm value. Additionally, the need for both stock market participants and the accounting process to estimate the value of these events before all uncertainty concerning their actual economic impact of firm value can be known will be illustrated. Open only to MBA and dual MBA students.

**Prerequisite(s):** ACC 505 and FIN 531 and (DS 520 or IMSE 514)

**Restriction(s):**
Can enroll if Program is MBA-Business Administration, MBA/ISE-Management & ISE Dual, MBA/MHSA-Management & HSA Dual, MBA/MSF-Management & Fin Dual, MBA/MSIS-Mgmt & Info Sys Dual, MBA-Business Admin (Web)

**ACC 657 Adv Auditing & Assurance Serv 3 Credit Hours**
Full Title: Advanced Auditing and Assurance Services Introduces students to advanced audit and assurance service practices, strategies, and techniques. Topics include audit strategy, fraud, internal and operation audits, auditor liability, issues in audit information technologies, and audit practice. (OC)

**Prerequisite(s):** ACC 457 or ACC 557

**Restriction(s):**
Can enroll if Level is Rackham or Graduate

**ACC 660 Advanced Federal Income Tax 3 Credit Hours**
Full Title: Advanced Federal Income Taxation Survey analysis of federal tax law relating to the formation, operation, and liquidation of corporations, partnerships, and LLCs, including current distributions; and the election, operation, and termination of Subchapter S corporations. (OC)

**Prerequisite(s):** ACC 560 or ACC 360

**Restriction(s):**
Can enroll if Level is Rackham or Graduate

* An asterisk denotes that a course may be taken concurrently.

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

### Business Administration

The Master of Business Administration, featuring courses in Applied Integrated Management, provides students with the integrated perspective required to solve today’s complex business problems.

The MBA may be completed in 36-48 credit hours.

The program offers expert faculty, expansive opportunities for networking, and the flexibility of evening and on-line courses, all from a highly-ranked program.

The degree is open to students of all undergraduate majors and all levels of work experience.

You may complete the program on campus, on-line, or any combination of the two. (Concentrations are optional, and most require a campus presence.) You may enroll on a full- or part-time basis, but course availability is greatest during the fall and winter semesters. The program can usually be completed within two to two-and-a-half years of part-time study, depending on core course waivers earned.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MBA may take up to 6 graduate credits during the final semester of their undergraduate program.

### MBA Goals and Objectives

**Goal 1:** Students will have an understanding of the core business disciplines and be able to apply this knowledge to global business situations.

**Objectives:** MBA students will:

- Demonstrate knowledge of disciplinary concepts, terminology, models, and perspectives.
- Identify business problems and apply appropriate solutions (problem-finding/problem-solving).
- Integrate knowledge across disciplinary areas (integrative thinking).
- Apply knowledge in a global environment.

**Goal 2:** Students will be effective communicators.

**Objectives:** MBA students will:

- Demonstrate an ability to effectively communicate in a manner that is typically required of a business professional.

**Goal 3:** Students will appreciate the importance of ethical/corporate social responsibility principles.

**Objectives:** MBA students will:

- Identify and explain alternative approaches to ethical/corporate social responsibility issues.
**MBA Admission Prerequisites**
- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver

**MBA Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
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</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td></td>
</tr>
<tr>
<td>BPS 516</td>
<td>Corporate Social Responsib</td>
<td></td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td></td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td></td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td></td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td></td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td></td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
<td></td>
</tr>
</tbody>
</table>

**Applied Integrated Management (AIM)**

**International AIM Course:**
Select one course from:
- BE 583 Global Econ: Crisis & Growth 3
- FIN 655 International Financial Mgt
- MKT 622 Global Marketing
- OB 610 Intrnatl Dimensions of Managmt

**AIM Capstone:**
- BPS 535 Strategic Plan and Dec Making 3

**General AIM Courses:**
Select two courses from:
- ACC 616 Corp Acts & Reacts & Firm Val
- BA 605 Mgrl Dec Making
- BPS 585 Managing Strat Innov & Change

**MBA Electives or Optional Concentration**
Complete at least one of the available concentrations (see below) or choose at least three elective courses 1

Total Credit Hours 21

1 Up to three graduate credits may be elected from units other than the College of Business. Elective courses must be approved by the Graduate Program Advisor in advance of course election.

Students may waive any or all of the core courses if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that is, your GPA in courses taken after your first 60 undergraduate credit hours).

Students who do not meet these criteria may request to have their courses evaluated for waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

Regardless of waiver credit granted, students must earn at least 36 credits in the MBA program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Waivers and transfer credit are granted at the discretion of the program faculty.

**MBA Breadth Requirements (3, 4, 5 Rule)**
- Complete AIM courses in at least 3 different disciplines
- Complete more than 4 AIM, Concentration, and Elective courses (12 credits) in any one discipline
- Complete graduate business courses in at least 5 different disciplines.
- No single course may be counted toward more than one MBA requirement or concentration.

**MBA Concentrations**
Concentrations are optional, and students may earn more than one. Some concentrations are available online; others require campus enrollment. Concentrations are awarded at the time of graduation.

**Accounting**
Available on campus
Choose any three graduate ACC courses beyond ACC 505.

**Business Analytics**
Available only on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>DS 570</td>
<td>Management Science</td>
<td>3</td>
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</table>

Choose two from the following:
- DS 630 Applied Forecasting
- DS 631 Decision Analysis
- DS 632 System Simulation
- DS 633 Data Mining for Business Appl

Total Credit Hours 9

**Finance**
Available online and on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
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</tr>
<tr>
<td>FIN 651</td>
<td>Invstmnt Proc, Analysis &amp; Mgmt</td>
<td></td>
</tr>
</tbody>
</table>

Select one course from:
- BE 583 Global Econ: Crisis & Growth
- FIN 581 Topics in Corporate Finance
- FIN 651 Invstmnt Proc, Analysis & Mgmt
- FIN 652 Derivatives & Risk Management
- FIN 654 Financial Intermediation
- FIN 655 International Financial Mgt
- FIN 657 Investment Fund Management

Select two courses from:

Total Credit Hours 9
Human Resource Management
Available only on campus

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tr>
<td>HRM 561</td>
<td>Human Resource Management</td>
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<tr>
<td>HRM 580</td>
<td>Compensation and HR Analytics</td>
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<tr>
<td>OB 610</td>
<td>Intrnatl Dimensions of Managmt</td>
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</table>

Information Systems Management
Available only on campus

Choose any three graduate ISM courses beyond ISM 525.

International Business
Available online and on campus

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
<td>9</td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>MKT 622</td>
<td>Global Marketing</td>
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<tr>
<td>OB 610</td>
<td>Intrnatl Dimensions of Managmt</td>
<td></td>
</tr>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
<td></td>
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</table>

Marketing
Available on campus

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MKT 565</td>
<td>Advanced Marketing Management</td>
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Select two courses from:

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<thead>
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<td>Graduate Market Research</td>
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<tr>
<td>MKT 620</td>
<td>Understanding Customers</td>
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<td>MKT 621</td>
<td>Advertising and Promotion</td>
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<td>MKT 622</td>
<td>Global Marketing</td>
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<tr>
<td>MKT 628</td>
<td>MKT Turning Data into Revenue</td>
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Total Credit Hours 6

Supply Chain Management
Available on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
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Select two courses from:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>OM 660</td>
<td>Supply Chain Analytics</td>
<td>3</td>
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<tr>
<td>OM 661</td>
<td>Supply Chain Logis Mgmt</td>
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<tr>
<td>OM 662</td>
<td>Product Dvlpmnt &amp; Tech Mgmt</td>
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</tr>
<tr>
<td>OM 663</td>
<td>Lean &amp; Six Sigma</td>
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</tbody>
</table>

Total Credit Hours 6

OM 664 Strategic Sourcing
OM 665 IT in SCM

Total Credit Hours 6

- MBA/MS in Finance (p. 888)
- MBA/MS-Information Systems (p. 892)
- MBA/MS-Supply Chain Management (p. 896)
- MBA/MSE-Industrial and Systems Engineering (p. 904)
- MBA/MHSA (p. 907)

BA 605 Mgrl Dec Making 3 Credit Hours
This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.

Prerequisite(s): BE 530 and MIS 525 and OB 510 and (DS 520 or IMSE 510 or IMSE 514)

BA 611 Organizational Economics 3 Credit Hours
This course focuses on the transactions and contracts that occur within and between organizations. You will learn economic frameworks that can inform decisions about a firm’s scope, internal hierarchies, and incentive structures. You will apply these frameworks to readings and cases about organizational failures (e.g., oil spills, rocket explosions, corruption cases), successes (e.g., initial iPhone commercialization), and contracting dilemmas (e.g., incomplete contracts, hold-up, asymmetric information, regulations and certifying organizations). Students interested in a wide variety of business professions will find the expertise gained in this course to be useful for decisions about structuring complex projects and company-wide initiatives, allocating scarce resources, and fostering organizational change. (YR)

Prerequisite(s): ACC 505 and BE 530 and OB 510
Restriction(s):
Can enroll if Degree is Master of Business Admin
Can enroll if College is Business

BA 690 Graduate Research 1 to 3 Credit Hours
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project’s completion.

Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Business
BA 691  Graduate Seminar  1 to 3 Credit Hours
Topics Course. To provide masters candidates with an opportunity for study of selected advanced topics in particular fields. Topics vary. See Schedule of Classes for current offerings. May be elected more than once if topics differ.
Prerequisite(s): (MIS 525 or MIS 502) and (MKT 515 or MKT 610)
Restriction(s):
Can enroll if Class is Graduate

BA 691A  Graduate Seminar  3 Credit Hours
Topic: The Internal Revenue Service. This course introduces the student to the structure, organization, practices and procedures of the Internal Revenue Service. The course is intended to give students an understanding of the organizational makeup of the Internal Revenue Service and the authority of its various employees. The different approaches to resolving tax controversies will be explored through the study of assigned readings and in-depth class discussions. The course will be conducted in a seminar-like fashion with each student expected to make significant contributions to class discussions. Attentiveness to news items affecting the area of federal tax procedures is expected, as well as conveyance to class of these newsworthy developments. This course is appropriate for MSA? Tax Concentration students.

An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Business Analytics

The Master of Science-Business Analytics trains students to create business strategies using data and statistics. Professionals in this rapidly expanding field use algorithms and formulas to uncover patterns and trends in aggregate data, then apply that knowledge to real-world business problems. The degree is open to students with strong quantitative and analytical skills, regardless of their undergraduate major. The program includes a large number of courses involving statistical analysis.

The program is offered on campus, and a few of the courses are also occasionally available on-line. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer. The program usually can be completed within 12 months of full-time study.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MS-Business Analytics may take up to 6 graduate credits during the final semester of their undergraduate program.

MS-Business Analytics Program Goals and Objectives

Goal 1: Students will acquire discipline-specific knowledge in business analytics.

Objectives: MS-Business Analytics students will:

- Evaluate business analytics approaches.
- Evaluate relevant business analytics tools and techniques.

Goal 2: Students will develop analytical skills for business problems.

Objectives: MS-Business Analytics students will:

- Formulate business analytics problems.
- Synthesize relevant business analytics information.
- Evaluate business analytics solution alternatives.

MS-Business Analytics Admission

Prerequisites

- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver

MS-Business Analytics Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Core Courses</td>
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</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>DS 570</td>
<td>Management Science</td>
<td>3</td>
</tr>
<tr>
<td>DS 630</td>
<td>Applied Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>DS 631</td>
<td>Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>DS 632</td>
<td>System Simulation</td>
<td>3</td>
</tr>
<tr>
<td>DS 633</td>
<td>Data Mining for Business Appl</td>
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<tr>
<td>Concentration</td>
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<td></td>
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<tr>
<td>Select one of the following concentrations:</td>
<td>12</td>
<td></td>
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<tr>
<td>Total Credit Hours</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Courses may not be taken off campus except by prior permission of the Academic Standards Committee. Permission is granted only in the case of unusual, extenuating circumstances.

Previous coursework deemed substantially similar to ACC 505, BE 530, DS 520, FIN 531, ISM 525, MKT 515 and OM 521 may qualify to exempt students from those courses. Exempt courses must be replaced with other approved courses in the degree program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions and transfer credit are granted at the discretion of the program faculty.

Concentrations

Financial Analytics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>1</td>
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<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>1</td>
</tr>
<tr>
<td>DS 635</td>
<td>Analytics Experience Capstone</td>
<td>1</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>1</td>
</tr>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
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### Dual Degrees

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>FIN 650</td>
<td>Corporate Valuation &amp; Strategy</td>
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</tr>
<tr>
<td>FIN 651</td>
<td>Investmnt Proc, Analysis &amp; Mgmt</td>
<td></td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td></td>
</tr>
<tr>
<td>FIN 653</td>
<td>Topics/Investments &amp; Cap Mkts</td>
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<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
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<tr>
<td>BA 690</td>
<td>Graduate Research</td>
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<tr>
<td>BA 691</td>
<td>Graduate Seminar</td>
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**Total Credit Hours** 12

### Human Resource Management Analytics

<table>
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<tr>
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<tbody>
<tr>
<td>HRM 561</td>
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<tr>
<td>HRM 580</td>
<td>Compensation and HR Analytics</td>
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<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
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Select one course from:

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<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>DS 635</td>
<td>Analytics Experience Capstone</td>
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<td>OB 610</td>
<td>Intrnatl Dimensions of Managmt</td>
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**Total Credit Hours** 12

### Informational Management and Coordination Analytics

<table>
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<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
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<tr>
<td>ISM 641</td>
<td>Enterprise Architecture Netwrk</td>
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<td>IT Policy and Strategy</td>
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Select one course from:

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>DS 635</td>
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</tr>
<tr>
<td>ISM 575</td>
<td>Information Management</td>
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<tr>
<td>ISM 642</td>
<td>Information Assurance</td>
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<td>Business Intelligence</td>
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<td>ISM 650</td>
<td>Info System Quality</td>
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<tr>
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</tr>
<tr>
<td>BA 691</td>
<td>Graduate Seminar</td>
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**Total Credit Hours** 12

### Marketing Analytics

<table>
<thead>
<tr>
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<tr>
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<td>MKT 564</td>
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Select two courses from:

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<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>MKT 565</td>
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<tr>
<td>MKT 620</td>
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<td>MKT 621</td>
<td>Advertising and Promotion</td>
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<td>MKT 622</td>
<td>Global Marketing</td>
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<tr>
<td>BA 690</td>
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**Total Credit Hours** 12

### Supply Chain Analytics

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<tbody>
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</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td></td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
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<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
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<tr>
<td>OM 660</td>
<td>Supply Chain Analytics</td>
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<tr>
<td>OM 661</td>
<td>Supply Chain Logis Mgmt</td>
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</tr>
<tr>
<td>OM 662</td>
<td>Product Dvlpmnt &amp; Tech Mgmt</td>
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<tr>
<td>OM 663</td>
<td>Lean &amp; Six Sigma</td>
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<tr>
<td>OM 664</td>
<td>Strategic Sourcing</td>
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<tr>
<td>OM 665</td>
<td>IT in SCM</td>
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<td>BA 690</td>
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</tr>
<tr>
<td>BA 691</td>
<td>Graduate Seminar</td>
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</tr>
</tbody>
</table>

**Total Credit Hours** 12

1. Students may elect either ACC 505 or BE 530 as credit toward the Financial Analytics concentration but not both.
2. Students must receive department approval.

### Dual Degrees

- Master of Business Administration/Master of Science in Finance (p. 888)
- Master of Business Administration/Master of Science-Information Systems (p. 892)
- Master of Business Administration/Master of Science-Supply Chain Management (p. 896)
- Master of Science in Accounting/Master of Science in Finance (p. 898)
- Master of Business Administration/Master of Science in Engineering-Industrial and Systems Engineering (p. 904)
- Master of Business Administration/Master of Health Services Administration (p. 907)

### Dual Degree, MBA/MS in Finance

The dual MBA/MS in Finance combines a broad managerial education with specialized training required for success in the financial professions.

Whether you select the corporate finance or the investments concentration, the Master of Science in Finance will help prepare you to succeed in your chosen finance profession, and the MBA will provide you with the perspective to help manage your organization and the people who work in it. If you have strong quantitative and analytical skills, we welcome your application, regardless of your undergraduate major or previous work experience.

The dual MBA/MS-Finance allows students to receive both the MBA and MS-Finance simultaneously upon completion of the required 57-66 credit hours.
You may complete the program on campus, on-line, or any combination of the two, depending on which program options you select. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MBA/MS-Finance may take up to 6 graduate credits during the final semester of their undergraduate program.

**MBA Goals and Objectives**

Goal 1: Students will have an understanding of the core business disciplines and be able to apply this knowledge to global business situations.

Objectives: MBA students will:

- Demonstrate knowledge of disciplinary concepts, terminology, models, and perspectives.
- Identify business problems and apply appropriate solutions (problem-finding/problem-solving).
- Integrate knowledge across disciplinary areas (integrative thinking).
- Apply knowledge in a global environment.

Goal 2: Students will be effective communicators.

Objectives: MBA students will:

- Demonstrate an ability to effectively communicate in a manner that is typically required of a business professional.

Goal 3: Students will appreciate the importance of ethical/corporate social responsibility principles.

Objectives: MBA students will:

- Identify and explain alternative approaches to ethical/corporate social responsibility issues.

**MS in Finance Goals and Objectives**

Goal 1: Students will demonstrate analytical skills in solving problems.

Objectives of the Corporate Finance concentration: MS in Finance students will have the ability to:

- Analyze and manage risk in a global setting.
- Estimate the value of real assets.
- Evaluate managerial decisions concerning financial policy.

Objectives of the Investments concentration: MS in Finance students will have the ability to:

- Analyze and manage risk in a global setting.
- Estimate the value of financial assets.
- Apply portfolio theory concepts to construct optimal risky assets portfolios that meet the objectives and constraints of their clients.

Goal 2: Students will be persuasive and/or informative communicators.

Objective 1: MS in Finance students will be able to convey finance knowledge through effective communication.

### MBA/MS in Finance Admission Prerequisites

- Mathematics admission prerequisite. Calculus is not required for admission to the MS in Finance. However, applicants who wish to pursue careers in investments or risk management, as well as those who wish to earn Chartered Financial Analysts (CFA) credentials, are strongly recommended to satisfy the Mathematics admission requirement with a college level Calculus course. Also, Calculus is a course prerequisite to FIN 656, an optional course in the Investments concentration. Students who wish to take this course must first complete a college level Calculus course with a grade of “C” or better.
- GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver.

### MBA/MS in Finance Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MBA Core Courses</strong></td>
<td></td>
</tr>
<tr>
<td>BPS 516</td>
<td>Corporate Social Responsib</td>
<td></td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
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</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
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</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td></td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
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</tr>
<tr>
<td></td>
<td><strong>Applied Integrated Management (AIM)</strong></td>
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<tr>
<td></td>
<td>International AIM Course:</td>
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<tr>
<td></td>
<td>Select one course from:</td>
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<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
<td></td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>MKT 622</td>
<td>Global Marketing</td>
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<tr>
<td>OB 610</td>
<td>Inntnatl Dimensions of Managmt</td>
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<tr>
<td></td>
<td>AIM Capstone:</td>
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<td>BPS 535</td>
<td>Strategic Plan and Dec Making</td>
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<td>General AIM Courses:</td>
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<tr>
<td></td>
<td>Select two courses from:</td>
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</tr>
<tr>
<td>ACC 616</td>
<td>Corp Acts &amp; Reacts &amp; Firm Val</td>
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</tr>
<tr>
<td>BA 605</td>
<td>Mgrl Dec Making</td>
<td></td>
</tr>
<tr>
<td>BPS 585</td>
<td>Managing Strat Innov &amp; Change</td>
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<tr>
<td></td>
<td><strong>MBA Electives or Optional Concentration</strong></td>
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</tr>
<tr>
<td></td>
<td>Complete at least one of the available MBA concentrations, excluding the Finance concentration (9 credits; see Concentrations listed under Master of Business Administration degree program), or choose at least three elective courses (9 credits)</td>
<td>9</td>
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<tr>
<td></td>
<td><strong>MSF Foundation Courses</strong> ²</td>
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<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
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<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
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<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
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<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
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MSF Concentrations

Corporate Finance

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<tr>
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<tbody>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
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</tr>
<tr>
<td>FIN 650</td>
<td>Corporate Valuation &amp; Strategy</td>
<td></td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
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</tr>
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**Accounting Electives:**

Select two of the following:  

<table>
<thead>
<tr>
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<th>Title</th>
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<td>ACC 514</td>
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<tr>
<td>ACC 516</td>
<td>Advanced Accounting</td>
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<tr>
<td>ACC 555</td>
<td>Cost Management</td>
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<tr>
<td>ACC 560</td>
<td>Intro Federal Income Taxation</td>
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<tr>
<td>ACC 601</td>
<td>Information Tech Auditing</td>
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<tr>
<td>ACC 603</td>
<td>Controllership</td>
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<tr>
<td>ACC 608</td>
<td>Financial Statement Analysis</td>
<td></td>
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<tr>
<td>ACC 660</td>
<td>Advanced Federal Income Tax</td>
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**General Electives:**

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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BE 583</td>
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<td></td>
</tr>
<tr>
<td>FIN 651</td>
<td>Invstmt Proc, Analysis &amp; Mgmt</td>
<td></td>
</tr>
<tr>
<td>FIN 654</td>
<td>Financial Intermediation</td>
<td></td>
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<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
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<td>FIN 657</td>
<td>Investment Fund Management</td>
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At most one of the following:

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<tr>
<td>DS 631</td>
<td>Decision Analysis</td>
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<td>DS 632</td>
<td>System Simulation</td>
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Total Credit Hours 12-21

**InVESTMENTS**

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<tr>
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<td>Invstmt Proc, Analysis &amp; Mgmt</td>
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<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
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<tr>
<td>FIN 653</td>
<td>Topics/Investments &amp; Cap Mkts</td>
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**Electives:**

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<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
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<td>FIN 654</td>
<td>Financial Intermediation</td>
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<td>FIN 655</td>
<td>International Financial Mgt</td>
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</tr>
<tr>
<td>FIN 656</td>
<td>Fixed Income Securities</td>
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<tr>
<td>FIN 657</td>
<td>Investment Fund Management</td>
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<td>BA 690</td>
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<td>BI 500</td>
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</tr>
<tr>
<td>DS 631</td>
<td>Decision Analysis</td>
<td></td>
</tr>
</tbody>
</table>

1. Up to three graduate credits may be elected from units other than the College of Business, with prior approval of the Graduate Program Advisor.
2. Each is required, but at most 3 courses/9 hours of MSF foundations may be counted toward the 57-66 required credit hours. Previous equivalent undergraduate or graduate coursework may qualify students to exempt any of the MSF foundation courses. Students must replace exempted MSF foundation courses with additional courses within their MSF concentration. See below.
3. At least one of these courses must be ACC 514, ACC 555 or ACC 608.

General Requirements

- Complete MBA AIM courses in at least 3 different disciplines.
- Complete no more than 4 AIM, MBA Concentration, and Elective courses (12 credits) in any one discipline other than Finance.
- Complete at least 5 BE and FIN courses (15 credits), excluding BE 530 and FIN 531.
- Complete no more than 7 courses (21 credits) in Finance, excluding FIN 531.
- Complete graduate business courses in at least 7 different disciplines.
- No single course may be counted toward more than one requirement or concentration in the dual degree program.

MBA Core Course Waivers

Students may waive BPS 516, ISM 525, MKT 515, OB 510 or OM 521 if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that is, the GPA in courses taken after the first 60 undergraduate credit hours). Students who do not meet these criteria may request to have their courses evaluated for waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

MSF Foundation Course Exemptions

Previous coursework deemed substantially similar to ACC 505, BE 530, DS 520 or FIN 531 may qualify to exempt students from these MSF foundations courses. Students who use more than one MSF foundations course exemption must replace those courses with elective courses within their MSF concentration.

Regardless of waiver and exemption credits granted, students must earn at least 57 credits in the dual-degree program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions, waivers and transfer credit are granted at the discretion of the program faculty.
BA 605  Mgrl Dec Making  3 Credit Hours
This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.
Prerequisite(s): BE 530 and MIS 525 and OB 510 and (DS 520 or IMSE 510 or IMSE 514)

BA 690  Graduate Research  1 to 3 Credit Hours
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project's completion.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Business

BA 691  Graduate Seminar  1 to 3 Credit Hours
Topics Course. To provide masters candidates with an opportunity for study of selected advanced topics in particular fields. Topics vary. See Schedule of Classes for current offerings. May be elected more than once if topics differ.
Prerequisite(s): (MIS 525 or MIS 502) and (MKT 515 or MKT 610)
Restriction(s):
Can enroll if Class is Graduate

BA 691A  Graduate Seminar  3 Credit Hours
Topic: The Internal Revenue Service. This course introduces the student to the structure, organization, practices and procedures of the Internal Revenue Service. The course is intended to give students an understanding of the organizational makeup of the Internal Revenue Service and the authority of its various employees. The different approaches to resolving tax controversies will be explored through the study of assigned readings and in-depth class discussions. The course will be conducted in a seminar-like fashion with each student expected to make significant contributions to class discussions. Attentiveness to news items affecting the area of federal tax procedures is expected, as well as conveyance to class of these newsworthy developments. This course is appropriate for MSA? Tax Concentration students.

FIN 531  Fin Fundament & Value Creation  3 Credit Hours
This course provides the fundamentals of the finance discipline with an emphasis of value creation as the primary objective of a corporation. Capital budgeting analysis and techniques are extensively discussed. Valuation of securities is presented along with an introduction to modern portfolio theory and market efficiency. Issues related to international financial management are also introduced.
Prerequisite(s): (Mathematics Placement with a score of 105 or MATH 104 or MATH 105 or MATH 113 or MATH 115) and (DS 520* or IMSE 514*) and ACC 505
Restriction(s):
Can enroll if Class is Graduate

FIN 581  Topics in Corporate Finance  3 Credit Hours
This course integrates theory and practice for major topics such as capital structure and dividend policy. Additional topics include leasing, corporate governance, mergers and acquisitions, short-term financial management, and risk management. These topics are examined from the perspective of the corporate financial manager.
Prerequisite(s): FIN 531 and BE 530* and ACC 505 and (DS 520 or IMSE 514)

FIN 650  Corporate Valuation & Strategy  3 Credit Hours
This course examines a variety of financial management topics, such as project and enterprise valuation and risk analysis, corporate restructuring, dividend policy, corporate governance, and current asset management using case studies and readings.
Prerequisite(s): FIN 581 and BE 530

FIN 651  Invstmnt Proc, Analysis & Mgmt  3 Credit Hours
This course provides an examination of the process of investment analysis and management. Topics include: analysis of fixed income securities, stock valuation, and introduction to derivative securities; discussion of portfolio theory and management; and an overview of investment environment. Wherever it is appropriate, the above topics will also be discussed in a global context.
Prerequisite(s): ACC 505 and FIN 531 and (DS 520* or IMSE 514*)
Restriction(s):
Can enroll if Class is Graduate

FIN 652  Derivatives & Risk Management  3 Credit Hours
The focus of this course is on understanding the derivative securities and their use in risk management. This course provides an in-depth introduction to options and option pricing as well as an extensive overview of forward, future and swap contracts. This course will draw upon the intuition and analytic tools developed to examine sophisticated financial products or strategies that firms and investors have used in their risk management.
Prerequisite(s): FIN 531 and ACC 505 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Class is Graduate
FIN 653  Topics/Investments & Cap Mkts  3 Credit Hours
This course prepares students for career development and advancement in the challenging investment profession. The course provides an in-depth study of advanced contemporary topics in global investments and capital markets that are selected from the common body of knowledge of the Chartered Financial Analysts (CFA) program. Topics may include a subset of: advanced investment theory and valuation techniques, asset allocation, behavioral finance, hedge fund, emerging markets and global investing, ethics for investment professionals, financial statements and security analysis, market efficiency, market microstructure, portfolio management and performance evaluation, etc. The format and the topics may vary in each offering.
Prerequisite(s): FIN 651 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Class is Graduate

FIN 654  Financial Intermediation  3 Credit Hours
Financial Intermediaries provide services to borrowers and lenders, often creating new securities or providing brokerage services broadly defined. Intermediaries include depository institutions such as commercial banks and non-depository institutions such as security firms, pension funds and insurance companies. This course studies the functions of intermediaries, the industry regulations, and competition in a deregulated environment. Special emphasis is placed on financial markets and fiscal instruments created by intermediaries, risk of intermediation, risk management, and financial innovations in the industry.
Prerequisite(s): FIN 531* and ACC 505 and (DS 520 or IMSE 514)

FIN 655  International Financial Mgt  3 Credit Hours
This course views international finance at the micro level, but of necessity it will cover some aspects of macro-level international finance as well, such as the international financial system and balance of payments mechanism. The following topics will be covered: the international financial system, balance of payments, foreign exchange, exchange risk management, international financial markets, foreign investment, and foreign trade financing.
Prerequisite(s): FIN 531 and ACC 505 and BE 530 and (DS 520 or IMSE 514)

FIN 656  Fixed Income Securities  3 Credit Hours
The fixed income market, accompanied by the introduction of sophisticated financial engineering techniques, has grown enormously over the last two decades. Today, the fixed income market has been a vital segment of the global financial market. This course covers major topics associated with this market, including bond pricing, yields, and volatility; term structure of interest rates and yield curve; market structure and analytical techniques for Treasury, municipal, corporate bonds, mortgage-backed securities, asset-backed securities, and bond with embedded options. The fundamental objective of this course is to help students develop analytical skills for pricing fixed income securities and managing interest rate risk. In addition, materials covered in this course are compatible with the Common Body of Knowledge in Analysis of Debt Investments that is required by the Chartered Financial Analysts (CFA) examination. Students will not receive credit for both FIN 456 and FIN 656.
Prerequisite(s): (MATH 113 or MATH 115 or Mathematics Placement with a score of 116) and FIN 651* and (FIN 581 or FIN 652 or FIN 654 or FIN 655)
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.
Objectives: MBA students will:

- Identify and explain alternative approaches to ethical/corporate social responsibility issues.

**MS-Information Systems Goals and Objectives**

Goal 1: MS-Information Systems students will acquire discipline-specific knowledge and competencies.

Objectives: MS-Information Systems students will:

- Design an information system for an organization.
- Evaluate security risks of an organization.
- Use data to provide solutions to business questions.

Goal 2: MS-Information Systems students will develop effective communication skills.

Objectives: MS-Information Systems students will:

- Communicate complex information technology concepts orally.
- Communicate complex information technology concepts effectively in writing.

Goal 3: MS-Information Systems students will develop information technology strategy skills.

Objectives: MS-Information Systems students will:

- Be able to assess the impact of information technology strategy on organizational effectiveness.
- Manage information quality initiatives in organizations.

**MBS/MS-Information Systems Admission Prerequisite**

- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite, if applicant qualifies for the GMAT/GGRE waiver.

**MBA/MS-Information Systems Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>MBA Core Courses</strong></td>
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<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
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<td>BPS 516</td>
<td>Corporate Social Responsib</td>
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<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
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<td>DS 520</td>
<td>Applied Statistical Modeling</td>
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<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
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</tr>
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<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td>3</td>
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<td>MKT 515</td>
<td>Marketing Management</td>
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<td>OB 510</td>
<td>Organization Behavior</td>
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<td>OM 521</td>
<td>Operations Management</td>
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<td>International AIM Course:</td>
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<td>Select one course from:</td>
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<td></td>
<td>BE 583 Global Econ: Crisis &amp; Growth</td>
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<td></td>
<td>FIN 655 International Financial Mgt</td>
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<td>MKT 622</td>
<td>Global Marketing</td>
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<tr>
<td>OB 610</td>
<td>Intnral Dimensions of Managmt</td>
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**AIM Capstone:**

- BPS 535 Strategic Plan and Dec Making 3

**General AIM Courses:**

Select two courses from:

- ACC 616 Corp Acts & Reacts & Firm Val
- BA 605 Mgrl Dec Making
- BPS 585 Managing Strat Innov & Change

**MBA Electives or Optional Concentration**

Complete at least one of the available concentrations, excluding the Information Systems concentration (9 credits; see Concentrations listed under Master of Business Administration degree program), or choose at three elective courses (9 credits).

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ISM 575</td>
<td>Information Management</td>
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</tr>
<tr>
<td>ISM 641</td>
<td>Enterprise Architecture Netwrk</td>
<td>3</td>
</tr>
<tr>
<td>ISM 642</td>
<td>Information Assurance</td>
<td>3</td>
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<tr>
<td>ISM 644</td>
<td>IT Policy and Strategy</td>
<td>3</td>
</tr>
<tr>
<td>ISM 649</td>
<td>Business Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ISM 650</td>
<td>Info System Quality</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 66

1 Up to three graduate credits may be elected from units other than the College of Business, with prior approval of the Graduate Program Advisor.

**Breadth Requirements**

- Complete AIM courses in at least 3 different disciplines.
- Complete no more than 4 AIM, MBA Concentration, and Elective courses (12 credits) in any one discipline other than Finance.
- Complete no more than 7 courses (21 credits) in Management Information Systems courses (MIS) after completion of the MBA Core.
- Complete graduate business courses in at least 7 different disciplines.

No single course may be counted toward more than one requirement or concentration in the dual degree program.

Students may waive any of the MBA core courses except ISM 525 if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that is, the GPA in courses taken after the first 60 undergraduate credit hours). Students who do not meet these criteria may request to have their courses evaluated for waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

Previous coursework deemed substantially similar to ISM 525 may qualify to exempt students from the course. The exempt course must be replaced with other approved courses in the MS-Information Systems program.

Regardless of waiver and exemption credits granted, students must earn at least 57 credits in the dual-degree program, including at least 36 credits in the MBA portion of the program.
In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions, waivers and transfer credit are granted at the discretion of the program faculty.

**BA 605  Mgrl Dec Making  3 Credit Hours**
This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.

**Prerequisite(s):** BE 530 and MIS 525 and OB 510 and (DS 520 or IMSE 510 or IMSE 514)

**BA 690  Graduate Research  1 to 3 Credit Hours**
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project's completion.

**Restriction(s):**
- Can enroll if Class is Graduate
- Can enroll if College is Business

**BA 691A  Graduate Seminar  3 Credit Hours**
Topic: The Internal Revenue Service. This course introduces the student to the structure, organization, practices and procedures of the Internal Revenue Service. The course is intended to give students an understanding of the organizational makeup of the Internal Revenue Service and the authority of its various employees. The different approaches to resolving tax controversies will be explored through the study of assigned readings and in-depth class discussions. The course will be conducted in a seminar-like fashion with each student expected to make significant contributions to class discussions. Attentiveness to news items affecting the area of federal tax procedures is expected, as well as conveyance to class of these newsworthy developments. This course is appropriate for MSA? Tax Concentration students.

**ISM 525  Computer and Info Systems  3 Credit Hours**
This course focuses on the management concepts and information technology needed to create effective information systems. Topics include: a survey of information technology, information systems and organizations, strategic information systems, management support systems, and ethical and social issues in information systems.

**Restriction(s):**
- Can enroll if Class is Graduate

**ISM 526  IT Services Management  3 Credit Hours**
Students in IT Services Management will learn how to organize and operate in an IT environment centered on processes and services. Students will learn to use major models like ISO 20000 and the Information Technology Library (ITIL) as tools for managing and controlling the IT function within an organization. Upon completion of the course, students should be prepared for the ITIL Foundations examination.

**Prerequisite(s):** ISM 525* or MIS 525*

**ISM 527  Programming & Data Structures  3 Credit Hours**
This course introduces the basic concepts of program design, emphasizing an event-driven environment. Students will develop an understanding of fundamental programming logic and learn to use basic programming structures to solve simple business problems. Students are introduced to the program development cycle and programming principles, basic programming logic and structures, and common data types. Topic coverage may include an introduction to object-oriented programming and other next generation programming environments.

**Prerequisite(s):** ISM 525* or MIS 525*

**ISM 575  Information Management  3 Credit Hours**
This course examines the basic concepts of information management for business organizations. Database systems are examined as a key tool for managing information. The goal of this course is to provide adequate technical detail while emphasizing the organizational and implementation issues relevant to the management of computerized information in an organizational environment. Topics include data modeling, database design, data definition and manipulation languages, database administration, data standards and policies, data, quality, data integration, data warehousing and data mining.

**Prerequisite(s):** ISM 525* or MIS 525*
ISM 585  Network App Development  3 Credit Hours
This course is designed for students to explore the unique concerns in developing applications designed to run in a networked environment. The goal of this course is for students to gain proficiency in network-based programming languages, while at the same time understanding concerns specific to networked applications, such as security and latency. Topics include client-server development, distributed object models, training in specific languages such as PHP and PERL, programming and security, and networked application tuning.
Prerequisite(s): MIS 527 or ISM 527

ISM 640  Info Systems Development  3 Credit Hours
This course provides a foundation in systems analysis and design concepts, methodologies, techniques, and tools. Students will learn to analyze an organizational program, define user requirements, design an information system, and plan an implementation. Methodologies covered include the traditional life cycle approach as well as newer methodologies such as an object-oriented approach, joint application development (JAD), and prototyping. A semester-long project gives students the opportunity to apply these techniques to a business problem. This project will use technologies such as computer-aided software engineering (CASE) tool, a database management system (DBMS), fourth generation language.
Prerequisite(s): MIS 575* or ISM 575*

ISM 641  Enterprise Architecture Netwrk  3 Credit Hours
In this class, students will learn the principles of managing the hardware, software, networks, and data centers that are used in modern enterprises. Students will learn the interfacing of IT systems to business goals and objectives. Traditional architecture frameworks will be discussed, along with the integration of more contemporary topics like cloud networking, green computing, mobile enterprise/BYOD, and virtual services.
Prerequisite(s): MIS 525 or ISM 525

ISM 642  Information Assurance  3 Credit Hours
This course will provide the students with an exposure to the unique concerns and realities of assuring information and managing risks in the IT environment today. The course will cover principles of security from a managerial point of view, but will provide the students with enough of a technical focus to actively participate in the process of organizational security. Students will be exposed to the problems and dangers from insecure IS and the means, including physical, technical and administrative controls, to prevent security breaches, while also learning to respond to a breach when it does happen. Students will take this knowledge to learn to develop security plans and conduct security audits. Coursework will include extensive reading and seminar participation as well as time in the laboratory to explore and reinforce concepts.
Prerequisite(s): MIS 525 or ISM 525

ISM 643  Info Tech Project & Chg Mgmt  3 Credit Hours
This course examines the management of information systems projects in business organizations as well as human and organizational reactions to the changes brought about by new information systems. Topics include project planning, change control, project controls, project reporting, information systems projects and organizational change, factors affecting project success and failure, and project management software.
Prerequisite(s): MIS 525* or ISM 525*

ISM 644  IT Policy and Strategy  3 Credit Hours
This course provides an overview and an understanding of the issues involved in the strategic management of the information technology (IT) and information systems (IS) of an organization and the development of organizational strategies and policies considering environmental constraints. A broad range of issues and problems associated with the information assets of the organization and their alignment with the strategic goals of the organization is examined. An example of topics covered might include: ethical, privacy, and social issues arising within the new information environment; current laws and currently proposed laws and their implications; competition and monopoly in software and hardware markets; and online content and access. Since the course focuses on current issues, the reading each week consists of basic text chapters as well as readings contributed by the professor and class. These readings will change to reflect the dynamic environment of IT/IS. The course prepares students for IT strategy and policy analysis and development. Coursework includes extensive reading, seminar participation, case analysis, research projects, and examinations.
Prerequisite(s): MIS 525* or ISM 525*

ISM 645  Global Outsource IS Activities  3 Credit Hours
This course provides an overview and an understanding of the issues involved in extensive outsourcing in the global environmental. There exists a growing relationship between globalization, outsourcing, and information technology and the technological and social issues that support or inhibit this relationship is the focus of this class. An example of topics covered might include: national culture, the global IT manager, managing a global IT project, cultural diversity, and ethical and social issues. Since the course focuses on current issues, the reading each week consists of basic text chapters as well as current academic and practical articles. These readings will change to reflect the dynamic environment of IT/IS. Coursework will include extensive reading, seminar participation, case analysis, research projects, and examinations.
Prerequisite(s): MIS 525 or ISM 525 and (MIS 643 or ISM 643 or MIS 644 or ISM 644)

ISM 646  HCI Interface & Design  3 Credit Hours
This course introduces students to the fields of human computer interaction (HCI), interface design, and usability engineering. The cognitive aspects of HCI will be explored as well as several methods for usability evaluation/inspection. The course will include an examination of the emerging discipline of information architecture. Topics will include: HCI definitions, theories, and history; interface design principles and interaction methods; usability evaluation techniques; usability heuristics and design guidelines; perspectives of designers versus users; and user centered design.
Prerequisite(s): MIS 525 or ISM 525

ISM 647  Advanced Programming  3 Credit Hours
This course allows students to build on their programming skills learned in ISM 527. Students will be exposed to advanced programming topics, such as multi-threading, multimedia, exception handling, networks, database connections, component-based programming, Web-based applications, and non-technical issues in programming and application development. Students will be introduced to a computer-aided software environment and collaborate on building more complex applications based on business requirements.
Prerequisite(s): MIS 527 or ISM 527
The program allows students to receive both the MBA and MS-Supply Chain Management simultaneously upon completion of the required 57-66 credit hours.

All courses in the program are offered on campus; many are also available on-line. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MBA/MS-Supply Chain Management may take up to 6 graduate credits during the final semester of their undergraduate program.

### MBA Goals and Objectives

**Goal 1:** Students will have an understanding of the core business disciplines and be able to apply this knowledge to global business situations.

Objectives: MBA students will:

- Demonstrate knowledge of disciplinary concepts, terminology, models, and perspectives.
- Identify business problems and apply appropriate solutions (problem-finding/problem-solving).
- Integrate knowledge across disciplinary areas (integrative thinking).
- Apply knowledge in a global environment.

**Goal 2:** Students will be effective communicators.

Objectives: MBA students will:

- Demonstrate an ability to effectively communicate in a manner that is typically required of a business professional.

**Goal 3:** Students will appreciate the importance of ethical/corporate social responsibility principles.

Objectives: MBA students will:

- Identify and explain alternative approaches to ethical/corporate social responsibility issues.

### MS-Supply Chain Management Goals and Objectives

**Goal 1:** Students will acquire knowledge in supply chain management concepts and tools.

Objectives: MS-Supply Chain Management students will:

- Demonstrate understanding of supply chain management concepts.
- Demonstrate understanding of supply chain management problem-solving tools.

**Goal 2:** Students will develop skills to address relevant supply chain management issues and problems.

Objectives: MS-Supply Chain Management students will:
• Evaluate supply chain management problems using appropriate problem-solving approaches.
• Effectively communicate supply chain management issues.

MBA/MS-Supply Chain Management

Admission Prerequisites
• Mathematics admission prerequisite
• GMAT/GRE admission prerequisite

MBA/MS-Supply Chain Management Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MBA Core Courses</td>
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<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>3</td>
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<td>BPS 516</td>
<td>Corporate Social Responsib</td>
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<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
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<td>DS 520</td>
<td>Applied Statistical Modeling</td>
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<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
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<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td>3</td>
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<td>MKT 515</td>
<td>Marketing Management</td>
<td>3</td>
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<td>OB 510</td>
<td>Organization Behavior</td>
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<td>OM 521</td>
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<tr>
<td>Applied Integrated Management (AIM)</td>
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<td>International AIM course</td>
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<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
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<td>FIN 655</td>
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<td>MKT 622</td>
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<td>OB 610</td>
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<td>OM 571</td>
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<td>AIM Capstone</td>
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<td>BPS 535</td>
<td>Strategic Plan and Dec Making</td>
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<td>General AIM courses</td>
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<td>Choose two courses from:</td>
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<tr>
<td>ACC 616</td>
<td>Corp Acts &amp; Reacts &amp; Firm Val</td>
<td>6</td>
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<tr>
<td>BA 605</td>
<td>Mgrl Dec Making</td>
<td>3</td>
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<tr>
<td>BPS 585</td>
<td>Managing Strat Innov &amp; Change</td>
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<tr>
<td>MBA Electives or Optional Concentration 1</td>
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<tr>
<td>Complete at least one of the available concentrations, excluding the Supply Chain Management concentration (9 credits; see Concentrations listed under Master of Business Administration degree program), or choose at least two elective courses (6 credits).</td>
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<td>MS-Supply Chain Management Core Courses</td>
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<td>OM 571</td>
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<td>OM 660</td>
<td>Supply Chain Analytics</td>
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<td>DS 570</td>
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<tr>
<td>DS 633</td>
<td>Data Mining for Business Appl</td>
<td>9</td>
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1 Up to three graduate credits may be elected from units other than the College of Business, with prior approval of the Graduate Program Advisor.

Breadth Requirements
• Complete AIM courses in at least 3 different disciplines.
• Complete no more than 4 AIM, MBA Concentration, and Elective courses (12 credits) in any one discipline other than Finance.
• Complete no more than 7 courses (21 credits) in Operations Management (OM) after completion of the MBA Core.
• Complete graduate business courses in at least 7 different disciplines.

No single course may be counted toward more than one requirement or concentration in the dual degree program.

Students may waive ACC 505, BE 530, BPS 516, FIN 531, ISM 525, MKT 515, or OB 510 if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that is, the GPA in courses taken after the first 60 undergraduate credit hours). Students who do not meet these criteria may request to have their courses evaluated for waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

Previous coursework deemed substantially similar to DS 520, or OM 521 may qualify to exempt students from those courses. Exempt courses must be replaced with other MS-Supply Chain Management Elective Courses.

Regardless of waiver and exemption credits granted, students must earn at least 57 credits in the dual-degree program, including at least 36 credits in the MBA portion of the program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions, waivers and transfer credit are granted at the discretion of the program faculty.
BA 605  Mgr Dec Making  3 Credit Hours
This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.
Prerequisite(s): (BE 530 and MIS 525 and OB 510) and (DS 520 or IMSE 510 or IMSE 514)

BA 690  Graduate Research  1 to 3 Credit Hours
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project’s completion.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Business

BA 691  Graduate Seminar  1 to 3 Credit Hours
Topics Course. To provide masters candidates with an opportunity for study of selected advanced topics in particular fields. Topics vary. See Schedule of Classes for current offerings. May be elected more than once if topics differ.
Prerequisite(s): (MIS 525 or MIS 502) and (MKT 515 or MKT 610)
Restriction(s):
Can enroll if Class is Graduate

BA 691A Graduate Seminar  3 Credit Hours
Topic: The Internal Revenue Service. This course introduces the student to the structure, organization, practices and procedures of the Internal Revenue Service. The course is intended to give students an understanding of the organizational makeup of the Internal Revenue Service and the authority of its various employees. The different approaches to resolving tax controversies will be explored through the study of assigned readings and in-depth class discussions. The course will be conducted in a seminar-like fashion with each student expected to make significant contributions to class discussions. Attentiveness to news items affecting the area of federal tax procedures is expected, as well as conveyance to class of these newsworthy developments. This course is appropriate for MSA? Tax Concentration students.

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Dual Degree, MS in Accounting/MS in Finance

The dual MS in Accounting/MS in Finance offers students the opportunity to take advantage of course overlap between the MS in Accounting and MS in Finance curricula.

The program combines specialized training for careers in corporate accounting, controllership, and public accounting with specialized training required for success in the financial professions. Students select either the corporate finance or the investments concentration in the MS in Finance. Students in the program can complete the CPA exam preparation (https://umdearborn.edu/cob/undergraduate-programs/majors-minors-curriculum/professional-certifications/cpa-exam-preparation/) course through CPAexcel® at a significant discount, and even qualify to receive a 100% reimbursement.

The program is open to students with strong quantitative and analytical skills, regardless of their undergraduate majors.

The program allows students to receive both the MS in Accounting and the MS in Finance simultaneously upon completion of 51-57 credit hours, depending on applicable course exemptions and course choices.

All courses in the program are offered on campus; many are also available on-line. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer. The program usually can be completed within 24 months of full-time study.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the program may take up to 6 graduate credits during the final semester of their undergraduate program. Students must successfully complete their undergraduate degree before taking any additional graduate-level courses.

MS in Accounting Goals and Objectives

Goal: MS in Accounting students will be able to integrate theory and applications in a wide variety of business situations.

Objectives: MS in Accounting students will:

- Be able to effectively communicate ideas orally, in writing, and using computer technologies.
- Integrate multiple sources of information to formulate solutions to complex business issues.
- Apply standards and regulations that affect multinational businesses.
- Apply standards of practice to business situations.

MS in Finance Goals and Objectives

Goal 1: Students will demonstrate analytical skills in solving problems.

Objectives of the Corporate Finance concentration: MS in Finance students will have the ability to:
• Analyze and manage risk in a global setting.
• Estimate the value of real assets.
• Evaluate managerial decisions concerning financial policy.

Objectives of the Investments concentration: MS in Finance students will have the ability to:
• Analyze and manage risk in a global setting.
• Estimate the value of financial assets.
• Apply portfolio theory concepts to construct optimal risky assets portfolios that meet the objectives and constraints of their clients.

Goal 2: Students will be persuasive and/or informative communicators.

Objective 1: MS in Finance students will be able to convey finance knowledge through effective communication.

MS in Accounting/MS in Finance Admission Prerequisites
• Mathematics admission prerequisite. Calculus is not required for admission. However, applicants who wish to pursue careers in investments or risk management, as well as those who wish to earn Chartered Financial Analyst (CFA) credentials, are strongly recommended to satisfy the Mathematics admission requirement with a college level Calculus course. Also, Calculus is a course prerequisite to FIN 656, an optional course in the MSF Investments concentration. Students who wish to take this course must first complete a college level Calculus course with a grade of “C” or better.
• GMAT/GRE admission prerequisite, if applicant qualifies for the GMAT/GRE waiver.

MS in Accounting/MS in Finance Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>MSF Foundation Courses</strong></td>
<td></td>
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<tr>
<td></td>
<td>Required:</td>
<td></td>
</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>3</td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>MSF Concentration</strong></td>
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<tr>
<td></td>
<td>Select one of the following MSF concentrations:</td>
<td>18-21</td>
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</table>

MSF Concentrations

MSF Corporate Finance

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 650</td>
<td>Corporate Valuation &amp; Strategy</td>
<td>3</td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>MSF Accounting Electives:</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Select two of the following:</td>
<td></td>
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<tr>
<td>ACC 514</td>
<td>Financial Reporting</td>
<td></td>
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<tr>
<td>ACC 516</td>
<td>Advanced Accounting</td>
<td></td>
</tr>
<tr>
<td>ACC 555</td>
<td>Cost Management</td>
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MSF Investments

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>MSF Required:</strong></td>
<td></td>
</tr>
<tr>
<td>ACC 608</td>
<td>Financial Statement Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FIN 651</td>
<td>Investmnt Proc, Analysis &amp; Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>FIN 654</td>
<td>Financial Intermediation</td>
<td></td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>FIN 657</td>
<td>Investment Fund Management</td>
<td></td>
</tr>
<tr>
<td>BA 690</td>
<td>Graduate Research</td>
<td></td>
</tr>
<tr>
<td>BI 500</td>
<td>Business Internship</td>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td></td>
<td>At most one of the following:</td>
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<tr>
<td>DS 630</td>
<td>Applied Forecasting</td>
<td></td>
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<tr>
<td>DS 631</td>
<td>Decision Analysis</td>
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</tr>
<tr>
<td>DS 632</td>
<td>System Simulation</td>
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</tbody>
</table>

At least one of which must be ACC 514, ACC 555 or ACC 608.

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<tr>
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<tbody>
<tr>
<td></td>
<td><strong>MSF Electives:</strong></td>
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<tr>
<td></td>
<td>Select two of the following:</td>
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<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
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<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
<td></td>
</tr>
<tr>
<td>FIN 654</td>
<td>Financial Intermediation</td>
<td></td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>FIN 656</td>
<td>Fixed Income Securities</td>
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<tr>
<td>FIN 657</td>
<td>Investment Fund Management</td>
<td></td>
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<tr>
<td>BA 690</td>
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<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>3</td>
</tr>
<tr>
<td>ACC 514</td>
<td>Financial Reporting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 516</td>
<td>Advanced Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 555</td>
<td>Cost Management</td>
<td>3</td>
</tr>
<tr>
<td>ACC 557</td>
<td>Auditing</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

MS Core
ACC 560  Intro Federal Income Taxation  2  3
ACC 580  Accounting Information Systems  3

**MSA Electives**

The MSA Electives are NOT REQUIRED of students selecting the MSF Corporate Finance concentration. Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACC 539</td>
<td>Not-for-Profit Accounting  3</td>
<td></td>
</tr>
<tr>
<td>ACC 601</td>
<td>Information Tech Auditing  3</td>
<td></td>
</tr>
<tr>
<td>ACC 603</td>
<td>Controllership  3</td>
<td></td>
</tr>
<tr>
<td>ACC 604</td>
<td>Auditing &amp; Forensic Examination</td>
<td></td>
</tr>
<tr>
<td>ACC 605</td>
<td>International Accounting</td>
<td></td>
</tr>
<tr>
<td>ACC 608</td>
<td>Financial Statement Analysis</td>
<td></td>
</tr>
<tr>
<td>ACC 614</td>
<td>Advanced Accounting II  3</td>
<td></td>
</tr>
<tr>
<td>ACC 657</td>
<td>Adv Auditing &amp; Assurance Serv  3</td>
<td></td>
</tr>
<tr>
<td>ACC 660</td>
<td>Advanced Federal Income Tax  3</td>
<td></td>
</tr>
<tr>
<td>LE 510</td>
<td>Commercial Transactions  3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours**  51-57

2  Simultaneous credit toward the BBA Accounting major and MSA for students admitted to the Accounting 4+1 program.
3  Recommended for students who intend to take the CPA exam.

**General MSF Requirement**

Complete at least 15 BE and FIN credits, excluding BE 530 and FIN 531.

**MSF Foundation Course Exemptions**

Previous equivalent undergraduate or graduate coursework may qualify students to exempt any of the foundation courses. Students must replace exempt MSF foundation courses with additional courses within their MSF concentration.

**MSA Core Course Exemptions**

Previous equivalent undergraduate or graduate coursework may qualify students to exempt any of the core courses. Exempt core courses are replaced with additional MSA electives.

Previous coursework deemed substantially similar to BE 530, DS 520 or FIN 531 may qualify to exempt students from these MSF foundation courses. Students must replace exempt MSF foundation courses with additional courses within their MSF concentration.

Regardless of exemption credits granted, students must earn at least 51 credits in the dual-degree program if completing the MSF Corporate Finance concentration, or at least 54 credits if completing the MSF Investments concentration.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions and transfer credit are granted at the discretion of the program faculty.

**ACC 505  Devel & Interp Financial Info  3 Credit Hours**

Students learn how financial information is developed, interpreted and utilized in business. This is accomplished by studying financial accounting tools and estimation methods used for interpretation and managers' decisions relating to investing, financing, and operating activities. Topics include financial information development and analysis, accounting estimation techniques, and cash flow analysis. Financial accounting methodology with respect to the sales and receivables cycle, inventory, property, plant and equipment, liabilities, corporate equity and initial public offerings, and investments in other corporate entities are studied. Cases requiring critical analysis and interpretation may be integrated throughout the course.

**Restriction(s):**

Can enroll if Class is Graduate

**ACC 514  Financial Reporting  3 Credit Hours**

This course covers detailed financial statements, the theoretical foundations behind those statements and how the various transactions are reported on those statements. These transactions include financing through various ownership and debt instruments, off-balance sheet financing and leverage; investing in tangible and intangible operating assets; investing in financial instruments for return and risk management purposes; and investing in financial instruments to influence or control operations of other business units. Specifically, the course will review the accounting process and examine in detail the Income Statement, Balance Sheet and Statement of Cash flows including a study of the basics of revenue recognition, a detailed study of accounting for inventory, accounting for the life cycle of capital investments in non-current assets, various debt topics such as short term loans and payroll, as well as how companies account for long term debt and equity changes. These operating, financing and investing issues will be considered based on today's international business environment. (OC)

**Prerequisite(s):** ACC 505 or ACC 298

**Restriction(s):**

Can enroll if Level is Rackham or Graduate

**ACC 516  Advanced Accounting  3 Credit Hours**

To study selected advanced accounting topics which may include partnerships, business combinations, consolidated financial statements, multinational accounting and reporting, accounting for financial distress situations and regulation of accounting by the SEC. Students will not receive credit for both ACC 416 and ACC 516.

**Prerequisite(s):** ACC 357 or ACC 514

**Restriction(s):**

Can enroll if Program is MSA-Accounting

**ACC 520  Comm for Acct and Tax Prof  3 Credit Hours**

The ability to communicate effectively is an important skill for the tax professional. This course develops this important skill in tax compliance and tax planning settings through a series of case studies. Emphasis will be placed on effectively communicating technical aspects of the tax law to management, clients, and other professional tax situations. Students cannot receive credit for both ACC 630 and ACC 520.

**Prerequisite(s):** ACC 360

**Restriction(s):**

Can enroll if Class is Graduate
ACC 539  Not-for-Profit Accounting  3 Credit Hours
To study the principles and procedures of accounting for not-for-profit entities. Topics may include: state and local government financial accounting, financial accounting for selected other entities, managerial concepts and current issues. Student will not receive credit for both ACC 439 and ACC 539.
Prerequisite(s): ACC 356 or ACC 505
Restriction(s):
Can enroll if Program is MSA-Accounting

ACC 555  Cost Management  3 Credit Hours
To introduce how cost and managerial accounting concepts and techniques can be applied to fully utilize information created by contemporary accounting information systems. The theoretical and empirical nature of cost management reports, their structures and contents, are emphasized with the goal of highlighting the relevance and limitations of this information in decision making. The course gives consideration to global and individual responsibility center performance by covering such topics as product costing, control standards, cost allocation, pricing, quality, short-term and long-term budgeting, and performance evaluation. In addition, the reciprocal roles of accounting and technology in enhancing efficiency and effectiveness benchmarks are investigated. Interwoven into course coverage are ethical, diversity, critical thinking, and global dimensions of business. This course also integrates emerging issues and techniques to assist managers and consultants in the accounting, finance, marketing, and human resources arenas.
Prerequisite(s): ACC 505
Restriction(s):
Can enroll if Class is Graduate

ACC 557  Auditing  3 Credit Hours
To study generally accepted auditing standards, internal control, principal audit objectives, the structure of audit programs, audit procedures, professional legal liability, ethical standards, statistical sampling techniques, the audit of EDP systems, auditors report and management letters. (OC)
Prerequisite(s): ACC 505 or ACC 298

ACC 560  Intro Federal Income Taxation  3 Credit Hours
Full Title: Introduction to Federal Income Taxation Survey analysis of the basic framework utilized in measuring and reporting taxable income of individuals and business entities including gross income, deductions, tax rates, credits, timing issues and procedural matters. (OC)
Prerequisite(s): ACC 505 or ACC 298
Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 580  Accounting Information Systems  3 Credit Hours
Accounting uses techniques to take raw data and convert it into information that is useful to managers and investors. But is it possible to convert data into information without knowing what it relates to, where and how it was gathered and what its limitations are? We will address these questions as we study accounting information systems. To begin, we focus on how data for typical business processes is captured and processed in a computerized accounting system using relational databases. We'll then learn how to describe an organization's accounting-related processes in a professionally rigorous way via documentation using tools used in the profession. We'll finish by learning how to analyze accounting processes to find control weaknesses in them that might allow them to generate unreliable data that could compromise the assets or liabilities of the firm or the decisions made by accountants, the managers they support or investors. (OC)
Prerequisite(s): ACC 505 or ACC 298
Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 600  Financial Accounting Theory  3 Credit Hours
This course provides an overview of 1) various approaches to accounting theory formulation (including traditional, regulatory, events, behavioral, information processing, predictive, and positive approaches), and 2) alternative asset valuation and income determination models (including historical cost, replacement cost, net realizable value, and present value models, along with the impacts of price level adjustments). Particular attention is directed at how these various approaches impact the state of the art of Accounting and how they influence the future evolution of Accounting. Additionally, the course provides for exploration and critical examination of the evolution and present state of the Financial Accounting Standards Board conceptual framework. The nature of the topics covered will enhance understanding of current and developing generally accepted accounting principles.
Prerequisite(s): ACC 505 or ISM 525 or CIS 564
Restriction(s):
Can enroll if Class is Graduate

ACC 601  Information Tech Auditing  3 Credit Hours
With the increased capabilities of IT have come new risks for firms and or their auditors. Audit firms are finding that they can no longer audit ‘around the computer’. This requires CPAs to understand the types of risk arising in IT-based systems and consider their impact on a clients’ business and the audit. This course introduces you to these types of risk, the implications these risks have for the traditional audit and the other services public accountants provide to address IT-based risks. IT is also a powerful tool that accountants and auditors must know how to harness. Students will become proficient in applying commonly used electronic audit tools to conduct computer-assisted audit techniques (CAATs).
Prerequisite(s): ACC 505 or ISM 525 or CIS 564
Restriction(s):
Can enroll if Class is Graduate

ACC 602  Contemporary Accounting Issues  3 Credit Hours
This course provides in-depth exposure to emerging contemporary issues in accounting. Topics in the seminar change to reflect the most relevant professional issues. The issues chosen are designed to be not only timely but to also provide insight into emerging future areas of the profession. In addition to lecture material and readings, the lecturer may incorporate case material, research papers, and other teaching methods as appropriate.
Prerequisite(s): ACC 600 and ACC 601
ACC 603  Controllership  3 Credit Hours
The nature of the control function in business corporations is the focus of this course. Thus, classes cover the characteristics of management planning and control in functional and divisional organizations, responsibility accounting and the role of efficiency and effectiveness in performance measurement. Coverage also extends to controllers' roles in strategic planning, programming, and budgeting, transfer pricing, and their behavioral, global, ethical, and technological dimensions. Class presentations employ case analysis and emphasize the qualitative nature of controllership.
Prerequisite(s): ACC 355 or ACC 555
Restriction(s):
Can enroll if Class is Graduate

ACC 604  Auditing & Forensic Examination  3 Credit Hours
To study forensic examination and investigation techniques including typical embezzlement and financial statement fraud scenarios, fraud risk factors, sources and uses of evidence, and interrogation and surveillance techniques. Other course topics may include auditing standards for private and public companies, expanding assurance services, advanced internal control testing, audit objectives and procedures, ethical standards, sampling techniques, auditor's report, risk based auditing, and management letters. Special attention will be given to the changing role and services offered by internal and external auditors, auditor responsibility to the public, and the ability of the auditor to offer assurance. Prerequisites: Graduate standing.
Prerequisite(s): ACC 457 or ACC 557

ACC 605  International Accounting  3 Credit Hours
To study selected topics in international accounting and taxation. The course will examine accounting principles and practices of the major world economies and consider issues typically encountered by U.S. corporations in accounting for and reporting the financial activities of foreign operations. Students will explore taxation of international operations and tax planning for the U.S. based multinational corporation.
Prerequisite(s): ACC 608 or ACC 356 or ACC 357 or ACC 358

ACC 608  Financial Statement Analysis  3 Credit Hours
The objective of financial statement analysis is to examine the relationship between financial statement information and the measurement of firm value. The analysis merges actual firm value created by economic process and estimating firm value through accounting reporting methods. Students will develop tools to interpret financial statement information for use by investors, creditors, and other third party stakeholders. Topics include, but are not limited to, an overview of financial statements, basic financial analysis, profitability analysis and the quality of earnings, cash flow analysis, asset analysis, liability analysis, and valuation and equity analysis.
Prerequisite(s): ACC 505 and (FIN 531* or FIN 401*)
Restriction(s):
Can enroll if Class is Graduate

ACC 614  Advanced Accounting II  3 Credit Hours
This course is intended to help students gain expertise in preparing financial statements for complex business organizations. Specific topics include: The preparation of segmental and consolidated financial statements. Intricate accounting issues associated with business combinations including but not limited to combinations at the date of acquisition and periods post acquisition. Analysis of inter-company transactions such as inventory and asset transfers between parent and subsidiary. Reporting for segments of a business as well as interim reporting. Reporting foreign exchange issues including inter-period reporting and financial statement translation. Analysis of firm issues related to SEC reporting, re-organization, bankruptcy and troubled debt restructuring. Understanding of issues associated with fair-value reporting. International reporting issues associated with all of the above, as well as other, topics. (OC)
Prerequisite(s): ACC 416 or ACC 516
Restriction(s):
Can enroll if Level is Rackham or Graduate

ACC 616  Corp Acts & Reacts & Firm Val  3 Credit Hours
This course will analyze various decisions made by the firm relating to its operations as well as environmental impacts on its operations. This analysis will focus on the interpretation or translation of these decisions and environmental impacts by the two main providers of estimates of the firm's economic value, its own financial statements and the stock market. The primary objective of this course is to illustrate how quickly, or slowly, firm decisions and environmental impacts are impounded into these estimates of firm value. Additionally, the need for both stock market participants and the accounting process to estimate the value of these events before all uncertainty concerning their actual economic impact of firm value can be known will be illustrated. Open only to MBA and dual MBA students.
Prerequisite(s): ACC 505 and FIN 531 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Program is MBA-Business Administration, MBA/ISE-Management & ISE Dual, MBA/MHSA-Management & HSA Dual, MBA/MSF-Management & Fin Dual, MBA/MSIS-Mgmt & Info Sys Dual, MBA-Business Admin (Web)

ACC 657  Adv Auditing & Assurance Serv  3 Credit Hours
Full Title: Advanced Auditing and Assurance Services Introduces students to advanced audit and assurance service practices, strategies, and techniques. Topics include audit strategy, fraud, internal and operation audits, auditor liability, issues in audit information technologies, and audit practice. (OC)
Prerequisite(s): ACC 457 or ACC 557
Restriction(s):

ACC 660  Advanced Federal Income Tax  3 Credit Hours
Full Title: Advanced Federal Income Taxation Survey analysis of federal tax law relating to the formation, operation, and liquidation of corporations, partnerships, and LLCs, including current distributions; and the election, operation, and termination of Subchapter S corporations. (OC)
Prerequisite(s): ACC 560 or ACC 360
Restriction(s):
Can enroll if Level is Rackham or Graduate
FIN 531  Fin Fundamentals & Value Creation  3 Credit Hours
This course provides the fundamentals of the finance discipline with an emphasis on value creation as the primary objective of a corporation. Capital budgeting analysis and techniques are extensively discussed. Valuation of securities is presented along with an introduction to modern portfolio theory and market efficiency. Issues related to international financial management are also introduced.
Prerequisite(s): (Mathematics Placement with a score of 105 or MATH 104 or MATH 105 or MATH 113 or MATH 115) and (DS 520* or IMSE 514*) and ACC 505
Restriction(s):
Can enroll if Class is Graduate

FIN 581  Topics in Corporate Finance  3 Credit Hours
This course integrates theory and practice for major topics such as capital structure, dividend policy, and mergers and acquisitions. Topics include: pricing of corporate securities, corporate governance, short-term financial management, and risk management. These topics are examined from the perspective of the corporate financial manager.
Prerequisite(s): FIN 531 and BE 530* and ACC 505 and (DS 520 or IMSE 514)

FIN 650  Corporate Valuation & Strategy  3 Credit Hours
This course examines a variety of financial management topics, such as project and enterprise valuation and risk analysis, corporate restructuring, dividend policy, corporate governance, and current asset management using case studies and readings.
Prerequisite(s): FIN 581 and BE 530

FIN 651  Investmtn Proc, Analysis & Mgmt  3 Credit Hours
This course provides an examination of the process of investment analysis and management. Topics include: analysis of fixed income securities, stock valuation, and introduction to derivative securities; discussion of portfolio theory and management; and an overview of investment environment. Wherever it is appropriate, the above topics will also be discussed in a global context.
Prerequisite(s): ACC 505 and FIN 531 and (DS 520* or IMSE 514*)
Restriction(s):
Can enroll if Class is Graduate

FIN 652  Derivatives & Risk Management  3 Credit Hours
The focus of this course is on understanding the derivative securities and their use in risk management. This course provides an in-depth introduction to options and option pricing as well as an extensive overview of forward, future, and swap contracts. This course will draw upon the intuition and analytic tools developed to examine sophisticated financial products or strategies that firms and investors have used in their risk management.
Prerequisite(s): FIN 531 and ACC 505 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Class is Graduate

FIN 653  Topics/Investments & Cap Mkts  3 Credit Hours
This course prepares students for career development and advancement in the challenging investment profession. The course provides an in-depth study of advanced contemporary topics in global investments and capital markets that are selected from the common body of knowledge of the Chartered Financial Analysts (CFA) program. Topics may include a subset of: advanced investment theory and valuation techniques, asset allocation, behavioral finance, hedge fund, emerging markets and global investing, ethics for investment professionals, financial statements and security analysis, market efficiency, market microstructure, portfolio management, and performance evaluation, etc. The format and the topics may vary in each offering.
Prerequisite(s): FIN 651 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Class is Graduate

FIN 654  Financial Intermediation  3 Credit Hours
Financial intermediaries provide services to borrowers and lenders, often creating new securities or providing brokerage services broadly defined. Intermediaries include depositary institutions such as commercial banks and non-depository institutions such as security firms, pension funds, and insurance companies. This course studies the functions of intermediaries, the industry regulations, and competition in a deregulated environment. Special emphasis is placed on financial markets and fiscal instruments created by intermediaries, risk of intermediation, risk management, and financial innovations in the industry.
Prerequisite(s): FIN 531* and ACC 505 and (DS 520 or IMSE 514)

FIN 655  International Financial Mgt  3 Credit Hours
This course views international finance at the micro level, but of necessity it will cover some aspects of macro-level international finance as well, such as the international financial system and balance of payments mechanism. The following topics will be covered: the international financial system, balance of payments, foreign exchange, exchange risk management, international financial markets, foreign investment, and foreign trade financing.
Prerequisite(s): FIN 531 and ACC 505 and BE 530 and (DS 520 or IMSE 514)

FIN 656  Fixed Income Securities  3 Credit Hours
The fixed income market, accompanied by the introduction of sophisticated financial engineering techniques, has grown enormously over the last two decades. Today, the fixed income market has been a vital segment of the global financial market. This course covers major topics associated with this market, including bond pricing, yields, and volatility; term structure of interest rates and yield curve; market structure and analytical techniques for Treasury, municipal, corporate bonds, mortgage-backed securities, asset-backed securities, and bond with embedded options. The fundamental objective of this course is to help students develop analytical skills for pricing fixed income securities and managing interest rate risk. In addition, materials covered in this course are compatible with the Common Body of Knowledge in Analysis of Debt Investments that is required by the Chartered Financial Analysts (CFA) examination. Students will not receive credit for both FIN 456 and FIN 656.
Prerequisite(s): (MATH 113 or MATH 115 or Mathematics Placement with a score of 116) and FIN 651* and (FIN 581 or FIN 652 or FIN 654 or FIN 655)
Restriction(s):
Can enroll if Class is Graduate

* An asterisk denotes that a course may be taken concurrently.
Dual Degree, MBA/MSE in Industrial and Systems Engineering

The MBA/MSE-Industrial Systems Engineering has been carefully developed to meet the increasing need for professionals who have expertise in both engineering and management. It is open to students who have completed a Bachelor of Science degree in engineering, a physical science, computer science, or applied mathematics.

The program is offered jointly by the College of Business and the College of Engineering and Computer Science. It allows students to receive both the MBA and MSE-ISE simultaneously upon completion of the required 57-66 credit hours.

You may complete the program on campus, on-line, or any combination of the two, and you may enroll on a full- or part-time basis.

Admission is rolling, and you may begin the program in September, January, or May. Students must apply and be admitted to the MBA and the MSE-ISE programs separately. University of Michigan-Dearborn students who have been admitted to the program may take up to 6 graduate business credits during the final semester of their undergraduate program.

Program Goals and Objectives

Master of Business Administration

Goal 1: Students will have an understanding of the core business disciplines and be able to apply this knowledge to global business situations.

Objectives: MBA students will:

1. Demonstrate knowledge of disciplinary concepts, terminology, models, and perspectives.
2. Identify business problems and apply appropriate solutions (problem-finding/problem-solving).
3. Integrate knowledge across disciplinary areas (integrative thinking).
4. Apply knowledge in a global environment.

Goal 2: Students will be effective communicators.

Objectives: MBA students will:

1. Demonstrate an ability to effectively communicate in a manner that is typically required of a business professional.

Goal 3: Students will appreciate the importance of ethical/corporate social responsibility principles.

Objectives: MBA students will:

1. Identify and explain alternative approaches to ethical/corporate social responsibility issues.

Admission Prerequisites

Master of Business Administration

• Mathematics admission prerequisite
• GMAT/GRE admission prerequisite

MSE in Industrial and Systems Engineering

• Completion of a bachelor of science degree in engineering, a physical science, computer science, or applied mathematics
• A course in Probability and Statistics equivalent to IMSE 510
• A course in Operations Research equivalent to IMSE 500

MBA/MSE Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>3</td>
</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>3</td>
</tr>
<tr>
<td>BPS 516</td>
<td>Corporate Social Responsib</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td>3</td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

MBA Applied Integrated Management (AIM)

International AIM Course:
Select one course from:
- BE 583  Global Econ: Crisis & Growth
- FIN 655  International Mgmt
- MKT 622  Global Marketing
- OB 610  Intrnat Dimensions of Managmt

AIM Capstone:
- BPS 535  Strategic Plan and Dec Making

General AIM Courses:
Select two courses from:
- ACC 616  Corp Acts & Reacts & Firm Val
- BA 605  Mgrl Dec Making
- BPS 585  Managing Strat Innov & Change

MBA Electives or Optional Concentration

Complete at least one of the available concentrations (see below) or choose at least three elective courses.

ISE Core
- IMSE 501  Human Factors & Ergonomics
- IMSE 511  Design and Analysis of Exp
- IMSE 514  Multivariate Statistics
- IMSE 580  Prod & Oper Engineering I

ISE Concentration

Students must complete four courses from one or more of the ISE Concentration areas below.

Total Credit Hours 57-66

1 Up to three graduate credits may be elected from units other than the College of Business. Elective courses must be approved by the Graduate Program Advisor in advance of course election.
MBA Concentrations

Concentrations are optional, and students may earn more than one. Some concentrations are available online; others require campus enrollment. Concentrations are awarded at the time of graduation.

Accounting
Available on campus

Choose any three graduate ACC courses beyond ACC 505.

Business Analytics
Available on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>DS 570</td>
<td>Management Science</td>
<td>3</td>
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Choose two from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>DS 630</td>
<td>Applied Forecasting</td>
<td></td>
</tr>
<tr>
<td>DS 631</td>
<td>Decision Analysis</td>
<td></td>
</tr>
<tr>
<td>DS 632</td>
<td>System Simulation</td>
<td></td>
</tr>
<tr>
<td>DS 633</td>
<td>Data Mining for Business Appl</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 9

Finance
Available online and on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FIN 651</td>
<td>Investmnt Proc, Analysis &amp; Mgmt</td>
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</tbody>
</table>

Select two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
<td></td>
</tr>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
<td></td>
</tr>
<tr>
<td>FIN 651</td>
<td>Investmnt Proc, Analysis &amp; Mgmt</td>
<td></td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td></td>
</tr>
<tr>
<td>FIN 654</td>
<td>Financial Intermediation</td>
<td></td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>FIN 657</td>
<td>Investment Fund Management</td>
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</table>

Total Credit Hours 9

Human Resource Management
Available only on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRM 561</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>HRM 580</td>
<td>Compensation and HR Analytics</td>
<td></td>
</tr>
<tr>
<td>OB 610</td>
<td>Intraparl Dimensions of Managmt</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 9

International Business
Available online and on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
<td></td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>MKT 622</td>
<td>Global Marketing</td>
<td></td>
</tr>
<tr>
<td>OB 610</td>
<td>Intraparl Dimensions of Managmt</td>
<td></td>
</tr>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 9

Information Systems Management
Available on campus

Choose any three ISM graduate courses other than ISM 525.

Marketing
Available on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 565</td>
<td>Advanced Marketing Management</td>
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Select two courses from:

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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MKT 564</td>
<td>Graduate Market Research</td>
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<tr>
<td>MKT 620</td>
<td>Understanding Customers</td>
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<tr>
<td>MKT 621</td>
<td>Advertising and Promotion</td>
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<tr>
<td>MKT 622</td>
<td>Global Marketing</td>
<td></td>
</tr>
<tr>
<td>MKT 628</td>
<td>MKT Turning Data into Revenue</td>
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</table>

Total Credit Hours 9

Supply Chain Management
Available on campus

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
<td>3</td>
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</table>

Select two courses from:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>OM 660</td>
<td>Supply Chain Analytics</td>
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<td>OM 661</td>
<td>Supply Chain Logis Mgmt</td>
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</tr>
<tr>
<td>OM 662</td>
<td>Product Dvlpmnt &amp; Tech Mgmt</td>
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<tr>
<td>OM 663</td>
<td>Lean &amp; Six Sigma</td>
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<tr>
<td>OM 664</td>
<td>Strategic Sourcing</td>
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</tr>
<tr>
<td>OM 665</td>
<td>IT in SCM</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 9

Courses may not be taken off campus except by prior permission of the Academic Standards Committee. Permission is granted only in the case of unusual, extenuating circumstances.

Program Details

Breadth Requirements

- Complete AIM courses in at least 3 different disciplines.
- Complete no more than four AIM, MBA Concentration, and MBA Elective Courses (12 credits) in any single discipline. This does not
apply to courses associated with the MSE in ISE portion of the dual-degree program.

- Complete graduate business courses in at least 5 different disciplines.

No single course may be counted toward more than one requirement or concentration in the dual degree program.

**Course Waivers and Transfer Credit**

Students may waive ACC 505, BE 530, BPS 516, FIN 531, MIS 525, MKT 515, and OB 510 if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that is, your GPA in courses taken after your first 60 undergraduate credit hours). Students who do not meet these criteria may request to have their courses evaluated for waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

Regardless of waiver and exemption credits granted, students must earn at least 57 credits in the dual-degree program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Waivers and transfer credit are granted at the discretion of the program faculty.

**ISE Track Options**

**Industrial and Systems Engineering**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>AENG 546</td>
<td>Vehicle Ergonomics II</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 543</td>
<td>Industrial Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 546</td>
<td>Safety Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 548</td>
<td>Res.Meth.Human Fctrs/Ergonomic</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 577</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 593</td>
<td>Vehicle Package Engineering</td>
<td>3</td>
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**Operations Research and Management Science Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>IMSE 505</td>
<td>Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5205</td>
<td>Eng Risk-Benefit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 559</td>
<td>System Simulation</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 605</td>
<td>Advanced Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 606</td>
<td>Advanced Stochastic Processes</td>
<td>3</td>
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**Integrated Design and Manufacturing Engineering**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>IMSE 513</td>
<td>Robust Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 519</td>
<td>Quan Meth in Quality Engin</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt and Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
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**Information Systems**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 557</td>
<td>Comp Networks and Comm</td>
<td>3</td>
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</tbody>
</table>

**Enterprise Information Systems Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 555</td>
<td>Decision Support/Expert Sys</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5585</td>
<td>Electronic Commerce</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 564</td>
<td>Meth &amp; Tech in ERP Sys Develop</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 570</td>
<td>Enterprise Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5715</td>
<td>Modeling of Int Info Syst</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5725</td>
<td>Object Oriented System Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 574</td>
<td>IS Based Prod Planning &amp; Cont</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 579</td>
<td>Software Int Mfg &amp; Logis Mgmt</td>
<td>3</td>
</tr>
</tbody>
</table>

**Program Management and Product Development**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMGT 580</td>
<td>Mgt of Prod and Proc Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 517</td>
<td>Managing Global Programs</td>
<td>3</td>
</tr>
</tbody>
</table>

**Advanced Manufacturing and Automation Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 502</td>
<td>Computer-Integrated Mfg</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 538</td>
<td>Intelligent Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 581</td>
<td>Prod &amp; Oper Engineering II</td>
<td>3</td>
</tr>
</tbody>
</table>

**BA 605 Mgrl Dec Making 3 Credit Hours**

This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.

**Prerequisite(s):** BE 530 and MIS 525 and OB 510 and (DS 520 or IMSE 510 or IMSE 514)
The MBA focuses on the organization, financing, marketing, and strategies as practiced in industries other than health care. It is valuable to understand the management of for-profit corporations in health care, and it provides a broader foundation for senior management positions in all sectors.

Students may complete the MBA portion of the dual degree in evening courses at the Dearborn campus, on-line, or any combination of the two. (The MBA concentrations are optional, and most require a campus presence.) Students may enroll on a full- or part-time basis, but course availability is greatest during the fall and winter semesters. The MHSA portion of the program requires full-time enrollment and daytime courses at the Ann Arbor campus. Students must verify the curriculum for the MHSA portion of this dual-degree program with their program advisor in the School of Public Health at UM-Ann Arbor.

Students must apply and be admitted to the MBA and MHSA separately. Students already enrolled in either degree may apply for the second degree before completing one-half of their degree requirements. Admission to the MBA is rolling, and students may begin the program in September or January. May admission is also usually possible for part-time students. For detailed information about admission to the MHSA, see sph.umich.edu/hmp/programs/mhsa.html (https://sph.umich.edu/hmp/programs/mhsa.html).

University of Michigan-Dearborn students who have been admitted to the program may take up to 6 graduate business credits during the final semester of their undergraduate program. Students must successfully complete their undergraduate degree before taking any additional graduate-level courses.

MBA Program Goals and Objectives

Goal 1: Students will have an understanding of the core business disciplines and be able to apply this knowledge to global business situations.

Objectives: MBA students will:

- Demonstrate knowledge of disciplinary concepts, terminology, models, and perspectives.
- Identify business problems and apply appropriate solutions (problem-finding/probem-solving).
- Integrate knowledge across disciplinary areas (integrative thinking).
- Apply knowledge in a global environment.

Goal 2: Students will be effective communicators.

Objectives: MBA students will:

- Demonstrate an ability to effectively communicate in a manner that is typically required of a business professional.

Goal 3: Students will appreciate the importance of ethical/corporate social responsibility principles.

Objectives: MBA students will:

- Identify and explain alternative approaches to ethincorporate social responsibility issues.
MHSA Program Goals and Objectives
View the core competencies taught in the Master of Health Services Administration (https://sph.umich.edu/hmp/programs/mhsa.html) program.

MBA/MHSA Admission Prerequisites
- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver
- Applicants must also meet admission requirements for the Master of Health Services Administration (https://sph.umich.edu/hmp/programs/mhsa.html)

MBA/Master of Health Services Administration Admission Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBA Core Courses</td>
<td></td>
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</tr>
<tr>
<td>Required:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td></td>
</tr>
<tr>
<td>BPS 516</td>
<td>Corporate Social Responsib</td>
<td></td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td></td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td></td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td></td>
</tr>
<tr>
<td>Select one of the following courses:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td></td>
</tr>
<tr>
<td>HMB 616</td>
<td>Understanding Organizations</td>
<td></td>
</tr>
<tr>
<td>HMB 643</td>
<td>Individual and Group Behavior in Health Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Organizations</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
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<td></td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td></td>
</tr>
<tr>
<td>HMP 665</td>
<td>Computer Information and Decision Support Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in Health Care</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
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<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>1</td>
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<tr>
<td>HMP 660</td>
<td>Microeconomic Theory</td>
<td></td>
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MBA Applied Integrated Management (AIM)
International AIM Course:
Select one course from: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
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<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
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<tr>
<td>MKT 622</td>
<td>Global Marketing</td>
</tr>
<tr>
<td>OB 610</td>
<td>Intrnatl Dimensions of Managmt</td>
</tr>
</tbody>
</table>

AIM Capstone:
BPS 535  Strategic Plan and Dec Making

General AIM Courses:
Select two courses from: 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ACC 616</td>
<td>Corp Acts &amp; Reacts &amp; Firm Val</td>
</tr>
<tr>
<td>BA 605</td>
<td>Mgrl Dec Making</td>
</tr>
<tr>
<td>BPS 585</td>
<td>Managing Strat Innov &amp; Change</td>
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School of Public Health Courses
EHS 500  Principles of Envir Health Sci
EPID 503  Strategies and Uses of Epidemiology

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>HMP 600</td>
<td>The Health Services System I</td>
</tr>
<tr>
<td>HMP 601</td>
<td>The Health Services System II</td>
</tr>
<tr>
<td>HMP 606</td>
<td>Managerial Accounting for Health Care</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
</tr>
<tr>
<td>HMP 607</td>
<td>Corporate Finance for Health Care Administration</td>
</tr>
<tr>
<td>HMP 608</td>
<td>Health Care Accounting</td>
</tr>
<tr>
<td>HMP 615</td>
<td>Introduction to Public Health Policy</td>
</tr>
<tr>
<td>HMP 620</td>
<td>Professional Development</td>
</tr>
<tr>
<td>HMP 660</td>
<td>Economics of Health Management and Policy I</td>
</tr>
<tr>
<td>HMP 663</td>
<td>Economics of Health Management and Policy II</td>
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Select one of the following courses: 3

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<tbody>
<tr>
<td>HMP 603</td>
<td>Organization and Management of Health Care Systems</td>
</tr>
<tr>
<td>HMP 604</td>
<td>Organization and Management of Health Advocacy</td>
</tr>
<tr>
<td></td>
<td>and Community-Based Non-profits</td>
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Select one of the following courses: 3

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>HMP 652</td>
<td>Health Law</td>
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<td>HMP 653</td>
<td>Law and Public Health</td>
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<tr>
<td>HMP 684</td>
<td>The Politics of Health Services Policy</td>
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<td>HMP 685</td>
<td>The Politics of Public Health Policy</td>
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Select one of the following courses: 3

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<th>Title</th>
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<tbody>
<tr>
<td>BIO 503</td>
<td>Intro to Biostatistics</td>
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<tr>
<td>BIO 553</td>
<td>Applied Biostatistics</td>
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Select one of the following courses: 3

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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>BIO 513</td>
<td>Application of Regression Analysis</td>
</tr>
<tr>
<td>BIO 523</td>
<td>Biostatistical Analysis</td>
</tr>
<tr>
<td>HMP 654</td>
<td>Operations Research and Control Systems</td>
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Select one of the following: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>HMP 664</td>
<td>Applied Health Policy Analysis</td>
</tr>
<tr>
<td>HMP 682</td>
<td>Case Studies in Health Services Administration</td>
</tr>
</tbody>
</table>

Electives
Students may complete one of the available MBA concentrations (see Business Administration degree page) or choose electives from either the MHSA or MBA programs. Students must complete at least 46 credits of MHSA courses and at least 36 credits of MBA courses total.

Total Credit Hours 82

Students who choose HMP 616, HMP 643, HMP 660, or HMP 665 must take additional MBA electives in order to reach the required minimum of 36 MBA credits.

Students taking HMP 607 may not enroll in the MBA course ACC 555.

Students taking HMP 607 may not enroll in the MBA course FIN 581.

Breadth Requirements
- Complete AIM courses in at least 3 different disciplines.
- Complete no more than four AIM, MBA Concentration, and MBA Elective Courses (12 credits) in any single discipline.
- Complete graduate business courses in at least 5 different disciplines.
- No single course may be counted toward more than one requirement or concentration in the dual degree program.

Students may waive any or all of the MBA core courses if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that
is, your GPA in courses taken after your first 60 undergraduate credit hours. Students who do not meet these criteria may request to have their courses evaluated for MBA core course waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

Regardless of waiver credit granted, students must earn at least 36 credits in the MBA program and 46 credits in the MHSA program. In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the MBA if those credits have not been counted toward a degree.

Waivers and transfer credit are granted at the discretion of the program faculty.

Admission, advising, academic records, and student services for MBA courses in this dual degree program are handled by the College of Business Graduate Programs Office. Admission, advising, academic records, and student services for MHSA courses in this dual degree program are handled by the School of Public Health at UM-Ann Arbor. For more information on the MHSA portion of the program, please visit the School of Public Health website at sph.umich.edu/hmp/programs/mhsa.html. (http://www.sph.umich.edu/hmp/programs/joint_degrees/mhsa-mba-dearborn.htm.html)

**BA 605  Mgrl Dec Making 3 Credit Hours**
This course covers the findings of research on behavioral decision making as they apply to managerial decision making. You will learn how the human mind works, what it is particularly good at and not so good at, and what the implications of this are for managerial decision making. The course will help you make better decisions and understand the potential shortcomings of the decisions made by your colleagues, competitors, collaborators, and customers. Topics include human cognition, overconfidence, heuristics and biases in decision making, bounded awareness, framing, preference reversal, motivational and emotional influences on decision making, escalation of commitment, expertise in decision making, and fairness and ethics in decision making. We will apply the research on behavioral decision making to a wide variety of problems in various domains of business, study how applications of information systems can mitigate limitations of the human mind, and apply our knowledge of the way the human mind works to develop an understanding of ways to improve managerial decision making. Students interested in careers in a wide variety of business professions will find the knowledge and skills gained in this course to be useful in their professional endeavors.

**Prerequisite(s):** BE 530 and MIS 525 and OB 510 and (DS 520 or IMSE 510 or IMSE 514)

**BA 690  Graduate Research 1 to 3 Credit Hours**
To provide masters candidates with the opportunity to undertake a research project under the supervision of a faculty member. The research topic is chosen by the student, in consultation with a faculty member in the appropriate discipline. Written approval must be obtained at least two weeks prior to registration on a form available in the Graduate Office. The request must include a comprehensive description of the proposed research project, as well as a time line for the project’s completion.

**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if College is Business

**BA 691  Graduate Seminar 1 to 3 Credit Hours**
Topics Course. To provide masters candidates with an opportunity for study of selected advanced topics in particular fields. Topics vary. See Schedule of Classes for current offerings. May be elected more than once if topics differ.

**Prerequisite(s):** (MIS 525 or MIS 502) and (MKT 515 or MKT 610)

**Restriction(s):**
Can enroll if Class is Graduate

**BA 691A  Graduate Seminar 3 Credit Hours**
Topic: The Internal Revenue Service. This course introduces the student to the structure, organization, practices and procedures of the Internal Revenue Service. The course is intended to give students an understanding of the organizational makeup of the Internal Revenue Service and the authority of its various employees. The different approaches to resolving tax controversies will be explored through the study of assigned readings and in-depth class discussions. The course will be conducted in a seminar-like fashion with each student expected to make significant contributions to class discussions. Atteniveness to news items affecting the area of federal tax procedures is expected, as well as conveyance to class of these newsworthy developments. This course is appropriate for MSA? Tax Concentration students.

* An asterisk denotes that a course may be taken concurrently.

**Frequency of Offering**

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Finance**

The Master of Science in Finance prepares students for success in the financial professions. Students elect either the Corporate Finance or the Investments concentration. The program is open to students with strong quantitative and analytical skills, regardless of their undergraduate major.

Students may enroll on a full- or part-time basis, but course availability is greatest during the fall and winter semesters. The program usually can be completed within 12-16 months of full-time study. Admission is rolling, and students may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MS-Finance may take up to 6 graduate credits during the final semester of their undergraduate program. Students must successfully complete their undergraduate degree before taking any additional graduate-level courses.

**MS in Finance Program Goals and Objectives**

Goal 1: Students will demonstrate analytical skills in solving problems.

Objectives of the Corporate Finance concentration: MS in Finance students will have the ability to:

- Analyze and manage risk in a global setting.
- Estimate the value of real assets.
- Evaluate managerial decisions concerning financial policy.
Objectives of the Investments concentration: MS in Finance students will have the ability to:

- Analyze and manage risk in a global setting.
- Estimate the value of financial assets.
- Apply portfolio theory concepts to construct optimal risky assets portfolios that meet the objectives and constraints of their clients.

Goal 2: Students will be persuasive and/or informative communicators.

Objective 1: MS in Finance students will be able to convey finance knowledge through effective communication.

**MS in Finance Admission Prerequisites**

- Mathematics admission prerequisite. Calculus is not required for admission to the MS in Finance. However, applicants who wish to pursue careers in investments or risk management, as well as those who wish to earn Chartered Financial Analysts (CFA) credentials, are strongly recommended to satisfy the Mathematics admission requirement with a college level Calculus course. Also, Calculus is a course prerequisite to FIN 656, an optional course in the Investments concentration. Students who wish to take this course must first complete a college level Calculus course with a grade of "C" or better.

- GMAT/GRE admission prerequisite, unless applicant qualifies for the exemption

**MS in Finance Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tr>
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<td></td>
<td>Required:</td>
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<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
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</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>3</td>
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<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
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</table>

**Concentrations**

**Corporate Finance**

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>FIN 650</td>
<td>Corporate Valuation &amp; Strategy</td>
<td></td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td></td>
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</tbody>
</table>

**Accounting Electives:** 6

Select two of the following:

- ACC 514 Financial Reporting
- ACC 516 Advanced Accounting
- ACC 555 Cost Management
- ACC 560 Intro Federal Income Taxation
- ACC 601 Information Tech Auditing
- ACC 603 Controllership
- ACC 608 Financial Statement Analysis
- ACC 660 Advanced Federal Income Tax

**General Electives:** 6-15

- BE 583 Global Econ: Crisis & Growth
- FIN 651 Invstmnt Proc, Analysis & Mgmt
- FIN 654 Financial Intermediation
- FIN 655 International Financial Mgt
- FIN 657 Investment Fund Management
- BA 690 Graduate Research
- BI 500 Business Internship

At most one of the following:

- DS 630 Applied Forecasting
- DS 631 Decision Analysis
- DS 632 System Simulation

**Investments**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>FIN 581</td>
<td>Topics in Corporate Finance</td>
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<tr>
<td>FIN 651</td>
<td>Invstmnt Proc, Analysis &amp; Mgmt</td>
<td></td>
</tr>
<tr>
<td>FIN 652</td>
<td>Derivatives &amp; Risk Management</td>
<td></td>
</tr>
<tr>
<td>FIN 653</td>
<td>Topics/Investments &amp; Cap Mktts</td>
<td></td>
</tr>
</tbody>
</table>

**Electives:** 9-18

- BE 583 Global Econ: Crisis & Growth
- FIN 581 Topics in Corporate Finance
- FIN 654 Financial Intermediation
- FIN 655 International Financial Mgt
- FIN 656 Fixed Income Securities
- FIN 657 Investment Fund Management
- BA 690 Graduate Research
- BI 500 Business Internship

At most one of the following:

- DS 630 Applied Forecasting
FIN 531  Fin Fundament & Value Creation  3 Credit Hours
This course provides the fundamentals of the finance discipline with an emphasis of value creation as the primary objective of a corporation. Capital budgeting analysis and techniques are extensively discussed. Valuation of securities is presented along with an introduction to modern portfolio theory and market efficiency. Issues related to international financial management are also introduced.
Prerequisite(s): (Mathematics Placement with a score of 105 or MATH 104 or MATH 105 or MATH 113 or MATH 115) and (DS 520* or IMSE 514*) and ACC 505
Restriction(s):
Can enroll if Class is Graduate

FIN 581  Topics in Corporate Finance  3 Credit Hours
This course integrates theory and practice for major topics such as capital structure and dividend policy. Additional topics include leasing, corporate governance, mergers and acquisitions, short-term financial management, and risk management. These topics are examined from the perspective of the corporate financial manager.
Prerequisite(s): FIN 531 and BE 530* and ACC 505 and (DS 520 or IMSE 514)

FIN 650  Corporate Valuation & Strategy  3 Credit Hours
This course examines a variety of financial management topics, such as project and enterprise valuation and risk analysis, corporate restructuring, dividend policy, corporate governance, and current asset management using case studies and readings.
Prerequisite(s): FIN 581 and BE 530

FIN 651  Invstmnt Proc, Analysis & Mgmt  3 Credit Hours
This course provides an examination of the process of investment analysis and management. Topics include: analysis of fixed income securities, stock valuation, and introduction to derivative securities; discussion of portfolio theory and management; and an overview of investment environment. Wherever it is appropriate, the above topics will also be discussed in a global context.
Prerequisite(s): ACC 505 and FIN 531 and (DS 520* or IMSE 514*)
Restriction(s):
Can enroll if Class is Graduate

FIN 652  Derivatives & Risk Management  3 Credit Hours
The focus of this course is on understanding the derivative securities and their use in risk management. This course provides an in-depth introduction to options and option pricing as well as an extensive overview of forward, future and swap contracts. This course will draw upon the intuition and analytic tools developed to examine sophisticated financial products or strategies that firms and investors have used in their risk management.
Prerequisite(s): FIN 531 and ACC 505 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Class is Graduate

FIN 653  Topics/Investments & Cap Mkts  3 Credit Hours
This course prepares students for career development and advancement in the challenging investment profession. The course provides an in-depth study of advanced contemporary topics in global investments and capital markets that are selected from the common body of knowledge of the Chartered Financial Analysts (CFA) program. Topics may include a subset of: advanced investment theory and valuation techniques, asset allocation, behavioral finance, hedge fund, emerging markets and global investing, ethics for investment professionals, financial statements and security analysis, market efficiency, market microstructure, portfolio management and performance evaluation, etc. The format and the topics may vary in each offering.
Prerequisite(s): FIN 651 and (DS 520 or IMSE 514)
Restriction(s):
Can enroll if Class is Graduate

FIN 654  Financial Intermediation  3 Credit Hours
Financial Intermediaries provide services to borrowers and lenders, often creating new securities or providing brokerage services broadly defined. Intermediaries include depository institutions such as commercial banks and non-depository institutions such as security firms, pension funds and insurance companies. This course studies the functions of intermediaries, the industry regulations, and competition in a deregulated environment. Special emphasis is placed on financial markets and fiscal instruments created by intermediaries, risk of intermediation, risk management, and financial innovations in the industry.
Prerequisite(s): FIN 531* and ACC 505 and (DS 520 or IMSE 514)

FIN 655  International Financial Mgt  3 Credit Hours
This course views international finance at the micro level, but of necessity it will cover some aspects of macro-level international finance as well, such as the international financial system and balance of payments mechanism. The following topics will be covered: the international financial system, balance of payments, foreign exchange, exchange risk management, international financial markets, foreign investment, and foreign trade financing.
Prerequisite(s): FIN 531 and ACC 505 and BE 530 and (DS 520 or IMSE 514)
FIN 656  Fixed Income Securities  3 Credit Hours
The fixed income market, accompanied by the introduction of sophisticated financial engineering techniques, has grown enormously over the last two decades. Today, the fixed income market has been a vital segment of the global financial market. This course covers major topics associated with this market, including bond pricing, yields, and volatility; term structure of interest rates and yield curve; market structure and analytical techniques for Treasury, municipal, corporate bonds, mortgage-backed securities, asset-backed securities, and bond with embedded options. The fundamental objective of this course is to help students develop analytical skills for pricing fixed income securities and managing interest rate risk. In addition, materials covered in this course are compatible with the Common Body of Knowledge in Analysis of Debt Investments that is required by the Chartered Financial Analysts (CFA) examination. Students will not receive credit for both FIN 456 and FIN 656.
Prerequisite(s): (MATH 113 or MATH 115 or Mathematics Placement with a score of 116) and FIN 651* and (FIN 581 or FIN 652 or FIN 654 or FIN 655)
Restriction(s):
Can enroll if Class is Graduate
FIN 657  Investment Fund Management  3 Credit Hours
This course introduces finance students to investing approaches and analytical techniques including both Intrinsic and Relativistic analyses used for security analysis employed and implemented by professional money managers. The course is recommended for finance students seeking to develop careers related to money management, investment analysis, financial analysis, portfolio management and related financial services careers. The main focus of the course is to gain the experience and skills of equity securities analyses through the Student Managed Investment Fund. The course requires application of fundamental and intrinsic equity analyses valuation. Graduate students are required to analyze data at a more advanced level than that required of undergraduate students. (F,W,OC) Students cannot receive credit for both FIN 457 and FIN 657
Prerequisite(s): FIN 407 or FIN 651

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Information Systems

The Master of Science-Information Systems provides the knowledge and skills required to manage IT projects, oversee application development, and develop an organization’s IT strategy.

The program will prepare you to manage information systems functions, as well as the organizational challenges facing information systems managers. If you have a background in fields such as information technology management, computer science, electronics engineering – or even if you simply have an aptitude for information technology – we welcome your application.

The program is offered on campus, and a few of the courses are also occasionally available on-line. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer. The program usually can be completed within 12 months of full-time study.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MS-Information Systems may take up to 6 graduate credits during the final semester of their undergraduate program.

MS-Information Systems Program Goals and Objectives

Goal 1: MS-Information Systems students will acquire discipline-specific knowledge and competencies.

Objectives: MS-Information Systems students will:

• Design an information system for an organization.
• Evaluate security risks of an organization.
• Use data to provide solutions to business questions.

Goal 2: MS-Information Systems students will develop effective communication skills.

Objectives: MS-Information Systems students will:

• Communicate complex information technology concepts orally.
• Communicate complex information technology concepts effectively in writing.

Goal 3: MS-Information Systems students will develop information technology strategy skills.

Objectives: MS-Information Systems students will:

• Be able to assess the impact of information technology strategy on organizational effectiveness.
• Manage information quality initiatives in organizations.

MS-Information Systems Admission Prerequisites

• Mathematics admission prerequisite
• GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver

MS-Information Systems Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<td>ISM 525</td>
<td>Computer and Info Systems</td>
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<td>ISM 575</td>
<td>Information Management</td>
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<td>ISM 641</td>
<td>Enterprise Architecture Netwrk</td>
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<td>ISM 642</td>
<td>Information Assurance</td>
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<td>ISM 644</td>
<td>IT Policy and Strategy</td>
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<td>ISM 649</td>
<td>Business Intelligence</td>
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<td>ISM 650</td>
<td>Info System Quality</td>
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Electives
Select three of the following courses: 9

<table>
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<tbody>
<tr>
<td>ACC 555</td>
<td>Cost Management</td>
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<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
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<td>DS 570</td>
<td>Management Science</td>
</tr>
<tr>
<td>DS 630</td>
<td>Applied Forecasting</td>
</tr>
<tr>
<td>DS 631</td>
<td>Decision Analysis</td>
</tr>
<tr>
<td>DS 632</td>
<td>System Simulation</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
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<tr>
<td>ISM 527</td>
<td>Programming &amp; Data Structures</td>
</tr>
<tr>
<td>ISM 643</td>
<td>Info Tech Project &amp; Chg Mgmt</td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
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<td>OM 521</td>
<td>Operations Management</td>
</tr>
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<td>OM 664</td>
<td>Strategic Sourcing</td>
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<td>OM 665</td>
<td>IT in SCM</td>
</tr>
<tr>
<td>BA 690</td>
<td>Graduate Research</td>
</tr>
<tr>
<td>BI 500</td>
<td>Business Internship</td>
</tr>
</tbody>
</table>

Total Credit Hours 9

Previous coursework deemed substantially similar to ISM 525, or an undergraduate degree in Information Systems Management, may qualify to exempt students from ISM 525. Exempt courses must be replaced with other elective courses in the degree program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions and transfer credit are granted at the discretion of the program faculty.

**Dual Degree, MBA/MS-Information Systems**

The MBA/MS-Information Systems combines a broad managerial education with in-depth training in the skills required to manage IT projects, oversee application development, and develop an organization’s IT strategy. The program is open to all students who have an aptitude for information technology, and it is particularly useful to students with backgrounds in information technology management, computer science, computer engineering, electronics engineering, and related fields. Students will learn how to manage the organizational challenges facing information systems managers while simultaneously acquiring the skills necessary to manage information systems functions.

The program allows students to receive both the MBA and MS-Information Systems simultaneously upon completion of the required 57-66 credit hours.

All courses in the program are offered on campus; many are also available on-line. Students may enroll on a full- or part-time basis, but course availability is greatest during the fall and winter semesters.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MBA/MS-Information Systems may take up to 6 graduate credits during the final semester of their undergraduate program. Students must successfully complete their undergraduate degree before taking any additional graduate-level courses.

**MBA/MS-Information Systems Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</table>

**MBA Core Courses**

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
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<tr>
<td>BPS 516</td>
<td>Corporate Social Responsib</td>
<td>3</td>
</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>3</td>
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<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
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<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
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<td>MKT 515</td>
<td>Marketing Management</td>
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<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td>3</td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
<td>3</td>
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</table>

**AIM Capstone:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS 535</td>
<td>Strategic Plan and Dec Making</td>
<td>3</td>
</tr>
</tbody>
</table>

**General AIM Courses:**

Select two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 616</td>
<td>Corp Acts &amp; Reacts &amp; Firm Val</td>
<td>3</td>
</tr>
<tr>
<td>BA 605</td>
<td>Mgrl Dec Making</td>
<td>3</td>
</tr>
<tr>
<td>BPS 585</td>
<td>Managing Strat Innov &amp; Change</td>
<td>3</td>
</tr>
</tbody>
</table>

**MBA Electives or Optional Concentration**

Complete at least one of the available concentrations, excluding the Information Systems concentration (9 credits; see Concentrations listed under Master of Business Administration degree program), or choose at three elective courses (9 credits).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISM 575</td>
<td>Information Management</td>
<td>3</td>
</tr>
<tr>
<td>ISM 641</td>
<td>Enterprise Architecture Netwrk</td>
<td>3</td>
</tr>
<tr>
<td>ISM 642</td>
<td>Information Assurance</td>
<td>3</td>
</tr>
<tr>
<td>ISM 644</td>
<td>IT Policy and Strategy</td>
<td>3</td>
</tr>
<tr>
<td>ISM 649</td>
<td>Business Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ISM 650</td>
<td>Info System Quality</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 66

Up to three graduate credits may be elected from units other than the College of Business, with prior approval of the Graduate Program Advisor.

**Breadth Requirements**

- Complete AIM courses in at least 3 different disciplines.
- Complete no more than 4 AIM, MBA Concentration, and Elective courses (12 credits) in any one discipline other than Finance.
• Complete no more than 7 courses (21 credits) in Management Information Systems courses (MIS) after completion of the MBA Core.

• Complete graduate business courses in at least 7 different disciplines.

No single course may be counted toward more than one requirement or concentration in the dual degree program.

Students may waive any of the MBA core courses except ISM 525 if they have equivalent courses in an AACSB business program completed within the previous 10 years and have earned at least a 3.2 post-60 GPA (that is, the GPA in courses taken after the first 60 undergraduate credit hours). Students who do not meet these criteria may request to have their courses evaluated for waiver credit at the time of admission. Students must have earned a B or better in equivalent courses as a part of a degree program completed within the previous 10 years.

Previous coursework deemed substantially similar to ISM 525 may qualify to exempt students from the course. The exempt course must be replaced with other approved courses in the MS-Information Systems program.

Regardless of waiver and exemption credits granted, students must earn at least 57 credits in the dual-degree program, including at least 36 credits in the MBA portion of the program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions, waivers and transfer credit are granted at the discretion of the program faculty.

ISM 525  Computer and Info Systems  3 Credit Hours
This course focuses on the management concepts and information technology needed to create effective information systems. Topics include: a survey of information technology, information systems and organizations, strategic information systems, management support systems, and ethical and social issues in information systems.

Restriction(s):
Can enroll if Class is Graduate

ISM 526  IT Services Management  3 Credit Hours
Students in IT Services Management will learn how to organize and operate in an IT environment centered on processes and services. Students will learn to use major models like ISO 20000 and the Information Technology Library (ITIL) as tools for managing and controlling the IT function within an organization. Upon completion of the course, students should be prepared for the ITIL Foundations examination.

Prerequisite(s): ISM 525* or MIS 525*

ISM 527  Programming & Data Structures  3 Credit Hours
This course introduces the basic concepts of program design, emphasizing an event-driven environment. Students will develop an understanding of fundamental programming logic and learn to use basic programming structures to solve simple business problems. Students are introduced to the program development cycle and programming principles, basic programming logic and structures, and common data types. Topic coverage may include an introduction to object-oriented programming and other next generation programming environments.

Prerequisite(s): ISM 525* or MIS 525*

ISM 575  Information Management  3 Credit Hours
This course examines the basic concepts of information management for business organizations. Database systems are examined as a key tool for managing information. The goal of this course is to provide adequate technical detail while emphasizing the organizational and implementation issues relevant to the management of computerized information in an organizational environment. Topics include data modeling, database design, data definition and manipulation languages, database administration, data standards and policies, data, quality, data integration, data warehousing and data mining.

Prerequisite(s): ISM 525* or MIS 525*

ISM 585  Network App Development  3 Credit Hours
This course is designed for students to explore the unique concerns in developing applications designed to run in a networked environment. The goal of this course is for students to gain proficiency in network-based programming languages, while at the same time understanding concerns specific to networked applications, such as security and latency. Topics include client-server development, distributed object models, training in specific languages such as PHP and PERL, programming and security, and networked application tuning.

Prerequisite(s): MIS 527 or ISM 527

ISM 640  Info Systems Development  3 Credit Hours
This course provides a foundation in systems analysis and design concepts, methodologies, techniques, and tools. Students will learn to analyze an organizational program, define user requirements, design an information system, and plan an implementation. Methodologies covered include the traditional life cycle approach as well as newer methodologies such as an object-oriented approach, joint application development (JAD), and prototyping. A semester-long project gives students the opportunity to apply these techniques to a business problem. This project will use technologies such as computer-aided software engineering (CASE) tool, a database management system (DBMS), fourth generation language.

Prerequisite(s): ISM 575* or ISM 575*

ISM 641  Enterprise Architecture Netwrk  3 Credit Hours
In this class, students will learn the principles of managing the hardware, software, networks, and data centers that are used in modern enterprises. Students will learn the interfacing of IT systems to business goals and objectives. Traditional architecture frameworks will be discussed, along with the integration of more contemporary topics like cloud networking, green computing, mobile enterprise/BYOD, and virtual services.

Prerequisite(s): MIS 525 or ISM 525

ISM 642  Information Assurance  3 Credit Hours
This course will provide the students with an exposure to the unique concerns and realities of assuring information and managing risks in the IT environment today. The course will cover principles of security from a managerial point of view, but will provide the students with enough of a technical focus to actively participate in the process of organizational security. Students will be exposed to the problems and dangers from insecure IS and the means, including physical, technical and administrative controls, to prevent security breaches, while also learning to respond to a breach when it does happen. Students will take this knowledge to learn to develop security plans and conduct security audits. Coursework will include extensive reading and seminar participation as well as time in the laboratory to explore and reinforce concepts.

Prerequisite(s): MIS 525 or ISM 525
ISM 643  Info Tech Project & Chg Mgmt  3 Credit Hours
This course examines the management of information systems projects in business organizations as well as human and organizational reactions to the changes brought about by new information systems. Topics include project planning, change control, project controls, project reporting, information systems projects and organizational change, factors affecting project success and failure, and project management software.
Prerequisite(s): MIS 525* or ISM 525*

ISM 644  IT Policy and Strategy  3 Credit Hours
This course provides an overview and an understanding of the issues involved in the strategic management of the information technology (IT) and information systems (IS) of an organization and the development of organizational strategies and policies considering environmental constraints. A broad range of issues and problems associated with the information assets of the organization and their alignment with the strategic goals of the organization is examined. An example of topics covered might include: ethical, privacy, and social issues arising within the new information environment; current laws and currently proposed laws and their implications; competition and monopoly in software and hardware markets; and online content and access. Since the course focuses on current issues, the reading each week consists of basic text chapters as well as readings contributed by the professor and class. These readings will change to reflect the dynamic environment of IT/IS. The course prepares students for IT strategy and policy analysis and development. Coursework includes extensive reading, seminar participation, case analysis, research projects, and examinations.
Prerequisite(s): MIS 525* or ISM 525*

ISM 645  Global Outsource IS Activities  3 Credit Hours
This course provides an overview and an understanding of the issues involved in extensive outsourcing in the global environmental. There exists a growing relationship between globalization, outsourcing, and information technology and the technological and social issues that support or inhibit this relationship is the focus of this class. An example of topics covered might include: national culture, the global IT manager, managing a global IT project, cultural diversity, and ethical and social issues. Since the course focuses on current issues, the reading each week consists of basic text chapters as well as current academic and practical articles. These readings will change to reflect the dynamic environment of IT/IS. Coursework will include extensive reading, seminar participation, case analysis, research projects, and examinations.
Prerequisite(s): MIS 525 or ISM 525 and (MIS 643 or ISM 643 or MIS 644 or ISM 644)

ISM 646  HCI Interface & Design  3 Credit Hours
This course introduces students to the fields of human computer interaction (HCI), interface design, and usability engineering. The cognitive aspects of HCI will be explored as well as several methods for usability evaluation/inspection. The course will include an examination of the emerging discipline of information architecture. Topics will include: HCI definitions, theories, and history; interface design principles and interaction methods; usability evaluation techniques; usability heuristics and design guidelines; perspectives of designers versus users; and user centered design.
Prerequisite(s): MIS 525 or ISM 525

ISM 647  Advanced Programming  3 Credit Hours
This course allows students to build on their programming skills learned in ISM 527. Students will be exposed to advanced programming topics, such as multi-threading, multimedia, exception handling, networks, database connections, component-based programming. Web-based applications, and non-technical issues in programming and application development. Students will be introduced to a computer-aided software environment and collaborate on building more complex applications based on business requirements.
Prerequisite(s): MIS 527 or ISM 527

ISM 648  Information Management II  3 Credit Hours
This course examines the processes and tools used to develop and administer database systems in business. Database systems used to support both transactions processing and decision-making in organizations are studied. A class project involving the development of a database using a client/server database management system is performed. Topics include database development, client/server databases, concurrency control, database security, administration of database privileges, and complex data retrieval commands.
Prerequisite(s): MIS 575 or ISM 575

ISM 649  Business Intelligence  3 Credit Hours
This course will introduce students to the fundamentals of data warehouses (DW) and data mining (DM). Topics will focus on how to leverage big data to support business decisions. Going through major activities involved in a data warehousing project, students will study the principles of dimensional data models, data warehouse architecture and infrastructure, techniques for data extraction, cleaning, transformation, and loading, online analytical processing (OLAP), and managerial issues of data warehouse implementation. Common data mining techniques and applications, such as decision trees association rules, text mining, rule based classification, cluster analysis, machine learning, will be introduced.
Prerequisite(s): MIS 525 or ISM 525

ISM 650  Info System Quality  3 Credit Hours
This course examines two related areas of study: (1) the concepts of information systems analysis and design in business organizations and (2) the management of information quality in organizations. Students will learn to plan and manage information systems projects, determine information requirements, model information process requirements, model system logic requirements, design user interfaces, and implement and maintain information systems. Students will also gain an understanding of the dimensions of information quality, the assessment and improvement of information quality in organizational settings, cognitive and behavioral aspects of information quality, and the effect of information quality on organizational decision making. The implications of information quality for systems analysis and design and applications of systems analysis and design methodologies for the management of information quality will be examined.
Prerequisite(s): MIS 525 or ISM 525

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally
Marketing

The Master of Science-Marketing at the University of Michigan-Dearborn equips you with skills necessary to manage core marketing functions, and it allows you to choose among numerous electives to tailor the degree to a wide variety of positions.

The degree is open to students from all undergraduate majors and all levels of work experience.

The program is offered on campus, and some courses are also available on-line. You may enroll on a full- or part-time basis during the fall and winter semesters, depending on your choice of electives, and some courses are often available during the summer. The program often can be completed within 10-12 months of full-time study.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

**MS-Marketing Program Goals and Objectives**

**Goal 1:** MS-Marketing students will demonstrate understanding of core marketing concepts.

**Objective:** MS-Marketing students will demonstrate a knowledge of marketing concepts, terminology, models, and perspectives.

**Goal 2:** MS-Marketing students will be able to apply knowledge of core marketing concepts to organizations and business situations.

**Objective:** MS-Marketing students will identify business problems and apply appropriate marketing solutions.

**MS-Marketing Admission Prerequisites**

- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver

**MS-Marketing Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 564</td>
<td>Graduate Market Research</td>
<td>3</td>
</tr>
<tr>
<td>MKT 565</td>
<td>Advanced Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 620</td>
<td>Understanding Customers</td>
<td>3</td>
</tr>
<tr>
<td>MKT 621</td>
<td>Advertising and Promotion</td>
<td>3</td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td></td>
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<tr>
<td>Choose four from the following:</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td></td>
</tr>
<tr>
<td>ACC 539</td>
<td>Not-for-Profit Accounting</td>
<td></td>
</tr>
<tr>
<td>ACC 555</td>
<td>Cost Management</td>
<td></td>
</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td></td>
</tr>
<tr>
<td>COMM 550</td>
<td>Prin of Organizational Comm</td>
<td></td>
</tr>
<tr>
<td>COMM 570</td>
<td>Adv Technical and Prof Comm</td>
<td></td>
</tr>
<tr>
<td>DS 633</td>
<td>Data Mining for Business Appl</td>
<td></td>
</tr>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td></td>
</tr>
</tbody>
</table>

**Program Requirements**

- Previous coursework deemed substantially similar to DS 520, if completed with a grade of "B" or better, may qualify to exempt students from that course. Exempt courses must be replaced with other approved courses in the degree program.

- In addition, up to 6 transfer credits for previous equivalent graduate coursework, if completed with a grade of "B" or better, may be applied to the degree if those credits have not previously been counted toward a degree.

- Exemptions and transfer credit are granted at the discretion of the program faculty.

- Any MKT graduate level course not listed on the core courses will be considered an elective for this program.

**MKT 515  Marketing Management  3 Credit Hours**

This course examines the concepts, problems and techniques associated with the activities of bringing both consumer and industrial products to the marketplace. Topics include: consumer and industrial buyer behavior, market segmentation, target marketing, as well as product, place, promotion and pricing strategies. Particular emphasis is placed on analysis of cases.

**Restriction(s):**

- Can enroll if Class is Graduate

**MKT 564  Graduate Market Research  3 Credit Hours**

The goal of this course is to familiarize students with marketing research concepts and techniques. The collection, analysis and interpretation of data for better managerial decision making will be emphasized. Topics include: problem definition, research design, questionnaire construction, sampling, statistical analysis, presentation and evaluation of research findings. (F, S, W)

**Prerequisite(s):** (DS 520 or IMSE 514) and MKT 515

**Restriction(s):**

- Can enroll if Level is Rackham or Graduate

**MKT 565  Advanced Marketing Management  3 Credit Hours**

This course examines the current challenges facing the marketers, ranging from industry deregulation, Internet revolution to globalizing. Looked at closely are the emerging issues impinging on marketing decision, particularly in regard to focused marketing, relationship marketing, competitive advantage, positioning, and the marketing mix strategies. Term project and case analyses are important components of the course.

**Prerequisite(s):** MKT 515

**MKT 620  Understanding Customers  3 Credit Hours**

This course introduces students to concepts and theories developed in the behavioral sciences (economics, marketing, psychology, sociology, and anthropology) in relation to their influence on consumer behavior. The course is designed to provide students with an in-depth understanding of consumer markets in order to develop effective marketing strategies.

**Prerequisite(s):** MKT 515
The Master of Science-Supply Chain Management at the University of Michigan-Dearborn teaches students how to manage the organizations, people, technology, and resources that transform raw materials into deliverable products.

The degree is open to students from all undergraduate majors.

You may enroll on a full- or part-time basis. The program is offered on campus, and a few of the courses are also occasionally available online. You may enroll on a full- or part-time basis during the fall and winter semesters, and some courses are often available during the summer. The program usually can be completed within 12 months of full-time study.

Admission is rolling, and you may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MS-Supply Chain Management may take up to 6 graduate credits during the final semester of their undergraduate program.
**MS-Supply Chain Management Program Goals and Objectives**

Goal 1: Students will acquire knowledge in supply chain management concepts and tools.

Objectives: MS-Supply Chain Management students will:
- Demonstrate understanding of supply chain management concepts.
- Demonstrate understanding of supply chain management problem-solving tools.

Goal 2: Students will develop skills to address relevant supply chain management issues and problems.

Objectives: MS-Supply Chain Management students will:
- Evaluate supply chain management problems using appropriate problem-solving approaches.
- Effectively communicate supply chain management issues.

**MS-Supply Chain Management Admission Prerequisites**

- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite, unless applicant qualifies for the GMAT/GRE waiver

**MS-Supply Chain Management Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td></td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
<td></td>
</tr>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
<td></td>
</tr>
<tr>
<td>OM 661</td>
<td>Supply Chain Logis Mgmt</td>
<td></td>
</tr>
<tr>
<td>OM 660</td>
<td>Supply Chain Analytics</td>
<td></td>
</tr>
<tr>
<td>OM 661</td>
<td>Supply Chain Logis Mgmt</td>
<td></td>
</tr>
<tr>
<td>OM 664</td>
<td>Strategic Sourcing</td>
<td></td>
</tr>
</tbody>
</table>

Electives

Select three from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 570</td>
<td>Management Science</td>
<td></td>
</tr>
<tr>
<td>DS 633</td>
<td>Data Mining for Business Appl</td>
<td></td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td></td>
</tr>
<tr>
<td>ISM 575</td>
<td>Information Management</td>
<td></td>
</tr>
<tr>
<td>ISM 649</td>
<td>Business Intelligence</td>
<td></td>
</tr>
<tr>
<td>OM 662</td>
<td>Product Dvlpmnt &amp; Tech Mgmt</td>
<td></td>
</tr>
<tr>
<td>OM 663</td>
<td>Lean &amp; Six Sigma</td>
<td></td>
</tr>
<tr>
<td>OM 665</td>
<td>IT in SCM</td>
<td></td>
</tr>
<tr>
<td>BA 690</td>
<td>Graduate Research</td>
<td></td>
</tr>
<tr>
<td>BA 691</td>
<td>Graduate Seminar</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 9

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions and transfer credit are granted at the discretion of the program faculty.

**Dual Degree, MBA/MS, Supply Chain Management**

The MBA/MS-Supply Chain Management dual degree combines a broad managerial education with specialized training in managing the organizations, people, technology, and resources that transform raw materials into deliverable products. The degree is open to all students, regardless of their undergraduate major. The program allows students to receive both the MBA and MS-Supply Chain Management simultaneously upon completion of the required 57-66 credit hours.

Students may enroll on a full- or part-time basis. All courses in the program are offered on campus; many are also available on-line. Course offerings are greatest during the fall and winter semesters. Admission is rolling, and students may begin the program in September or January. May admission is also usually possible for part-time students.

University of Michigan-Dearborn students who have been admitted to the MBA/MS-Supply Chain Management may take up to 6 graduate credits during the final semester of their undergraduate program. Students must successfully complete their undergraduate degree before taking any additional graduate-level courses.

**MBA/MS-Supply Chain Management Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td></td>
</tr>
<tr>
<td>BPS 516</td>
<td>Corporate Social Responsib</td>
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</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td></td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td></td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td></td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td></td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td></td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td></td>
</tr>
<tr>
<td>OM 521</td>
<td>Operations Management</td>
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</tr>
</tbody>
</table>

**Applied Integrated Management (AIM)**

**International AIM course**

Choose one course from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 583</td>
<td>Global Econ: Crisis &amp; Growth</td>
<td></td>
</tr>
<tr>
<td>FIN 655</td>
<td>International Financial Mgt</td>
<td></td>
</tr>
<tr>
<td>MKT 622</td>
<td>Global Marketing</td>
<td></td>
</tr>
<tr>
<td>OB 610</td>
<td>Intrnatl Dimensions of Managmt</td>
<td></td>
</tr>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
<td></td>
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**General AIM courses**

Choose two courses from:

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<tr>
<td>ACC 616</td>
<td>Corp Acts &amp; Reacts &amp; Firm Val</td>
<td></td>
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</table>
Exempt courses must be replaced with other MS-Supply Chain Management coursework deemed substantially similar to program completed within the previous 10 years. Must have earned a B or better in equivalent courses as a part of a degree program evaluated for waiver credit at the time of admission. Students who do not meet these criteria may request to have their coursework evaluated for waiver credit at the time of admission. No single course may be counted toward more than one requirement or concentration in the dual degree program.

Regardless of waiver and exemption credits granted, students must earn at least 57 credits in the dual-degree program, including at least 36 credits in the MBA portion of the program.

In addition, up to 6 transfer credits for previous equivalent graduate coursework can be applied to the degree if those credits have not been counted toward a degree.

Exemptions, waivers and transfer credit are granted at the discretion of the program faculty.

### College of Education, Health, and Human Services

**Our Work: Education, Health, and the Human Services**

The College of Education, Health, and Human Services aims to prepare and sustain exemplary practitioners and administrators for work in the interrelated fields of education, human health, and human services through an emphasis on scholarship, diversity, inclusion, and excellence in service delivery.

The College draws broadly upon institutional resources including faculty and programs in other colleges of the University. Additionally, facilities in local school districts, health-related settings, public agencies and private corporations regularly provide students with a spectrum of rich experiences.

The College contributes to the University of Michigan-Dearborn's impact as a dynamic metropolitan university in which teaching and research interact to develop leaders and new knowledge in the tradition of the University of Michigan. Students in CEHHS have the opportunity to participate in many organizations within the College, campus, and community.

### History of the College

Shortly after UM-Dearborn opened in 1959, a small teacher certification program was added to the liberal arts division. By 1969 the teacher certification program had grown into one of the largest academic departments on the campus. During 2012-13, the Regents of the University of Michigan authorized the addition of the Department of Health and Human Services (HHS), and the creation of the College of Education, Health, and Human Services (CEHHS).

### Graduate Degree Programs

Whether you are looking to develop your teaching skills, prepare for a career in healthcare IT or build your expertise in working with nonprofits, we have the program for you. The College of Education, Health, and Human Services offers a number of master's degree programs geared towards advancing student knowledge in health- and education-related career fields.

For a listing of graduate offerings and opportunities, see our G (https://umdearborn.edu/cehhs/graduate-programs/areas-study/) and Graduate Programs page (https://umdearborn.edu/cehhs/undergraduate-programs/areas-study/).

Details regarding any of the programs can be found in later sections of this **Graduate Catalog**.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS 585</td>
<td>Managing Strat Innov &amp; Change</td>
</tr>
</tbody>
</table>

### Breadth Requirements

- Complete at least one of the available concentrations, excluding the Supply Chain Management concentration (9 credits; see Concentrations listed under Master of Business Administration degree program), or choose at least two elective courses (6 credits).

### MS-Supply Chain Management Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
</tr>
<tr>
<td>OM 660</td>
<td>Supply Chain Analytics</td>
</tr>
<tr>
<td>OM 661</td>
<td>Supply Chain Logistics Mgmt</td>
</tr>
<tr>
<td>OM 664</td>
<td>Strategic Sourcing</td>
</tr>
</tbody>
</table>

### MS-Supply Chain Management Electives

Choose three of the following courses:  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 570</td>
<td>Management Science</td>
</tr>
<tr>
<td>DS 633</td>
<td>Data Mining for Business Appl</td>
</tr>
<tr>
<td>ISM 575</td>
<td>Information Management</td>
</tr>
<tr>
<td>ISM 649</td>
<td>Business Intelligence</td>
</tr>
<tr>
<td>OM 662</td>
<td>Product Dvlpmnt &amp; Tech Mgmnt</td>
</tr>
<tr>
<td>OM 663</td>
<td>Lean &amp; Six Sigma</td>
</tr>
<tr>
<td>OM 665</td>
<td>IT in SCM</td>
</tr>
<tr>
<td>BA 690</td>
<td>Graduate Research</td>
</tr>
<tr>
<td>BA 691</td>
<td>Graduate Seminar</td>
</tr>
</tbody>
</table>

Total Credit Hours: 66

1. Up to three graduate credits may be elected from units other than the College of Business, with prior approval of the Graduate Program Advisor.

## Notes

Previous coursework deemed substantially similar to DS 520, or OM 521 may qualify to exempt students from those courses. Exempt courses must be replaced with other MS-Supply Chain Management Elective Courses.
Admission to the College of Education, Health, and Human Services

The College of Education, Health, and Human Services prepares students through Master’s degree programs, an Education Specialist degree (Ed.S.) and a Doctorate in Education (Ed.D). More information on graduate level opportunities and admissions information can be found on the Graduate Programs webpage (https://umdearborn.edu/cehhs/graduate-programs/admission/).

Office of Student Success

The Office of Student Success for the College of Education, Health, and Human Services is located in 262 FCS. All matters relating to CEHHS student needs including academic advising, field placement, teacher certification, and student records and forms are handled here.

Academic Advising (https://umdearborn.edu/cehhs/cehhs-office-student-success/academic-advising/graduate-advising/)

Academic Advising at the graduate level is done by College faculty. Information on graduate level advising at CEHHS can be found on the Graduate Advising (https://umdearborn.edu/cehhs/cehhs-office-student-success/academic-advising/graduate-advising/) webpage (https://umdearborn.edu/cehhs/cehhs-office-student-success/academic-advising/graduate-advising/). The College has professional Academic Advisors that specialize in CEHHS programs and can help students navigate their coursework and requirements from beginning to end. Students are encouraged to meet with an Academic Advisor at least once a semester to support their success and progress.

Field Placement (https://umdearborn.edu/cehhs/cehhs-office-student-success/field-placement-office/)

Field placements allow for each learner to build skills, knowledge, and confidence in his/her own pathway toward becoming a professional in real world placements. All required clearances, paperwork, and placements for field assignments are handled within the CEHHS Office of Student Success.

Department of Education

Education is not one career; it is many. Individuals specializing in education are qualified to pursue a wide variety of attractive and rewarding professions including teaching, corporate training, recreation, social service, and childcare. Wherever there is a need for people specifically prepared to teach others, there is a need for individuals with a background in education.

Still, most college graduates seeking a career in education elect to become classroom teachers. Teaching offers a wide choice of opportunities to work with persons of different age levels in a variety of specialized fields. It is a satisfying career for those who like to inspire growth in others and continue their own development.

Students admitted to any of the education programs offered at UM-Dearborn are provided with an academic and professional background suited to the challenges of education in a multicultural society. For further information, please visit the College of Education, Health, and Human Services website at http://umdearborn.edu/cehhs/ (http://www.umdearborn.edu/cehhs/).

Accreditation (https://umdearborn.edu/cehhs/departments/education/about/accreditation/)

The University of Michigan-Dearborn Teacher Certification program is designed to produce graduates who are knowledgeable in their content areas and their use of pedagogy with diverse learners and who are prepared to become caring and reflective professionals. The Michigan Department of Education approval enables the College to offer programs and make recommendations resulting in state-issued certification of teachers and administrators. Additionally, certification is accredited by the Teacher Education Accreditation Council (TEAC), a subsidiary of the Council for the Accreditation of Educator Preparation (CAEP). This accreditation certifies that the program has provided evidence that it adheres to TEAC’s quality principles. The Early Childhood Education Center is accredited by the National Association for the Education of Young Children (NAEYC).

Department of Health and Human Services

The Department of Health and Human Services (HHS) prepares leaders, professionals, and scholars to improve the health and welfare of persons and communities in local, national, and global settings. HHS provides an innovative academic environment for students interested in improving the lives and health of vulnerable populations. HHS faculty enhance student learning by connecting classroom instruction with ongoing intervention research, meaningful field experiences and community outreach efforts. Students complete a rigorous interdisciplinary program of study and master valuable professional skills. HHS students are well prepared to launch their careers or pursue additional graduate training to help solve pressing problems and deliver exceptional health and human services.

Master’s Programs

• Applied Behavior Analysis (p. 922)
• Community Based Education (p. 923)
• Early Childhood Education (p. 924)
• Education (p. 926)

No Additional Endorsement Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/no-endorsement/)

English as a Second Language (ESL) Endorsement Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/esl/)

Reading Specialist K-12 Endorsement Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/reading-specialist/)

Teaching English to Speakers of Other Languages (TESOL) Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/tesol/)

• Educational Leadership (p. 933)
• Educational Technology (p. 934)
• Health Information Technology (p. 936)
• Program Evaluation and Assessment (p. 937)
• Teaching (p. 940)

Specialist Program

• Education (p. 928)
Doctorate Program
  • Education (p. 930)

Certificates
  • STEM² Teaching (p. 935)
  • Online Teaching (p. 936)
  • Teaching English to Speakers of Other Languages (p. 941)
  • Applied Behavior Analysis (p. 923)

Administration
Ann Lampkin-Williams, PhD, Dean
Stein Brunvand, PhD, Associate Dean
Paul Bielich, MLS, Instructional Learning Manager
Monique Davis, Assistant to the Dean
Rachel Fortune, MA, Field Placement Coordinator
Judy Garfield, Administrative Assistant Senior, Dept. of Education and Health and Human Services
Sharon Harris, Administrative Assistant, Dean’s Suite
Donna Kerry, MA, Certification Officer
Jonathan Larson, MA, Assistant Director of Advising
Claudia Lugo-Meeks, MEd, Instructional Learning Assistant
Amanda McBride, Program Assistant
Elizabeth Morden, Program Assistant
Lindsey Bookman, MA, Director of Advising and Records

Chairs and Directors
Christopher J. Burke, Director, EdD, EdS Program
Danielle DeFauw, Director, Field Placement
Susan A. Everett, Chair, Education
Paul Fossum, Director, Masters Degree Programs
Patricia A. Wren, Chair, Health and Human Services

Professors Emeriti
Adler, Martha A., PhD, University of Michigan, Associate Professor Emeritus of Education
Cepuran, Joseph, PhD, Associate Professor Emeritus of Public Administration
Collin, Claudia, PhD, Assistant Professor Emerita of Education
Kachaturoff, Grace, EdD, Professor Emerita of Education
Kettler, Raymond P., EdD, Associate Professor Emeritus of Education
Lazarus, Belinda, PhD, Professor Emerita of Education
Lipson, Greta B., EdD, Associate Professor Emerita of Education
Moyer, Richard, EdD, Professor Emeritus of Science Education
Otto, Charlotte, PhD, Professor Emerita of Chemistry and Education
Poster, John, PhD, Professor Emeritus of Public Administration and Education
Romatowski, Jane A., EdD, Professor Emerita of Education
Saltz, Rosalyn, PhD, Professor Emerita of Education
Sayles, Daniel G., PhD, Associate Professor Emeritus of Education
Trepanier-Street, Mary, EdD, Professor Emerita of Education
Van Tiem, Darlene, PhD, Associate Professor Emerita of Education
Verhey, Roger, PhD, Professor Emeritus of Education

Faculty
Department of Education
Beyer, Bonnie M., EdD, Vanderbilt University, Professor of Education and Educational Administration
Bock Hong, Seong, EdD, University of Massachusetts Amherst, Professor of Education
Brunvand, Stein, PhD, University of Michigan, Professor of Educational Technology
Burke, Christopher J., PhD, University of Illinois at Urbana-Champaign, Associate Professor of Science Education
DeFauw, Danielle, PhD, Oakland University, Associate Professor of Education
Duran, Mesut, PhD, Ohio University, Professor of Education
Everett, Susan A., PhD, University of Iowa, Professor of Science Education
Fossum, Paul, PhD, University of Minnesota, Professor of Education
Hill, David, PhD, University of Pittsburgh, Assistant Professor of Education
Hill, Kirsten, PhD, Michigan State University, Associate Professor of Education
Killu, Kim, PhD, Ohio State University, Professor of Education
Luea, Gail R., PhD, University of Michigan, Professor of Education
Park, Kyongson, PhD, Purdue University, Assistant Professor of Education
Shaffer, LaShorage, PhD, University of Illinois at Urbana-Champaign, Associate Professor of Education
Taylor, Julie, PhD, University of Cambridge, Professor of Education
Thomas-Brown, Karen, PhD, University of the West Indies, Associate Professor of Education

Department of Health and Human Services
Botoseneanu, Anda, PhD, University of Michigan, Associate Professor of Health Policy Studies
Martin, Lisa, PhD, University of Michigan, Associate Professor of Health Policy Studies and Women’s and Gender Studies
Cooperating Faculty

Polenco-Lopez, Jean-Carlos, PhD, University of Florida, Assistant Professor of Health and Human Services

Sampson, Natalie, PhD, University of Michigan, Assistant Professor of Public Health

Wren, Patricia A., PhD, University of Michigan, Professor of Health and Human Services

Special Programs and Centers

The College of Education, Health, and Human Services is recognized for its concentrated focus in several areas. This concentrated focus is designed to marshal available expertise at the institution in pursuit of regional needs and goals in several particular emphasis areas, including early childhood learning and instruction and inquiry-based science instruction.

- Curriculum Knowledge Center (CKC) (https://umdearborn.edu/cehhs/centers-institutes/curriculum-knowledge-center-ckc/)
- Early Childhood Education Center (https://umdearborn.edu/cehhs/centers-institutes/ectcc/)
- The Inquiry Institute (https://umdearborn.edu/cehhs/centers-institutes/inquiry-institute/)

Applied Behavior Analysis

The Master of Science degree in Applied Behavior Analysis prepares students with training in the science of learning and behavior and prepares them to work as Board Certified Behavior Analysts (BCBA). Applied Behavior Analysis (ABA) is a scientific approach to the study of behavior. Behavior analysts work directly with individuals to improve their social, educational, health, adaptive skills, and behavioral outcomes through the development of programming based upon the principles of ABA. Behavior analysts are trained to describe behavior, explain, predict, and analyze the occurrence and non-occurrence of behavior, and change behavior through the development of programming based on ABA principles.

Through coursework firmly grounded in theory, with an emphasis on application of theory to socially significant and effective practice, the M.S. in ABA program provides students with an excellent foundation to meet the proficiencies mandated by the Behavior Analyst Certification Board (BACB). Students will be prepared to complete the required supervised field work and sit for the Board Certified Behavior Analyst (BCBA) examination. Pass-rate data for University of Michigan-Dearborn candidates are not available at this time. Pass-rate data are not published for sequences with fewer than six first-time candidates in a single year or for sequences within their first four years of operation.

Pass-Rate Data (https://www.bacb.com/verified-course-sequences/) is available at the BACB website.

BCBAs provide services within mental health, educational, and human services environments that may include collecting and analyzing data, writing and evaluating behavior intervention plans, training others to implement components of treatment plans, and overseeing the implementation of treatment plans. BCBAs are qualified to provide services to individuals with a variety of needs such as academic performance, skill deficits (e.g., communication, adaptive behavior and functional skills), and problem behavior (e.g., aggression, self-injurious behavior), and social interactions. BCBAs also provide supervision to Board Certified Assistant Behavior Analysts (BCaBA) and Registered Behavior Technicians (RBT).

Admission Requirements

Students must submit the follow items with their application.

The GRE is not required for admission to this program. The Office of International Affairs lists additional admission requirements for international students (https://umdearborn.edu/admissions/graduate/how-apply/).

- Bachelor's degree from an accredited institution
- Official transcripts from all post-secondary institutions attended
- 3.0 GPA or higher on submitted transcripts
- Three professional letters of recommendation
- Personal statement

Transfer of Credit

A limit of six (6) credit hours can be transferred from a non-University of Michigan school and 15 credit hours of University of Michigan credit that are applicable to the program of study and approved by the program coordinator. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the Master of Science in Applied Behavior Analysis program and successful completion of eight (8) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for transfer credit. Courses cannot be transferred for credit if: a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the M.S. in Applied Behavior Analysis; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

Time Limits

All coursework toward the master's degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.

Program Requirements

The Master of Science in Applied Behavior Analysis is a 30 credit hour degree program. A minimum cumulative GPA of B (3.0 on a 4.0 scale) must be maintained to continue enrollment in the program. The program requires successful completion of the following courses:
The Applied Behavior Analysis (BCBA) certificate program provides students with an excellent foundation to meet the proficiencies mandated by the Behavior Analyst Certification Board (BACB). Students will be prepared to complete the required supervised field work and sit for the Board Certified Behavior Analyst (BCBA) examination.

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 506</td>
<td>Applied Behavior Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>EDC 507</td>
<td>Applied Behavior Analysis II</td>
<td>3</td>
</tr>
<tr>
<td>EDC 522</td>
<td>Science and Human Behavior</td>
<td>3</td>
</tr>
<tr>
<td>EDC 516</td>
<td>Research Methods Beh Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EDC 580</td>
<td>Behavioral Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDC 623</td>
<td>Ethics in ABA</td>
<td>3</td>
</tr>
<tr>
<td>EDC 624</td>
<td>Prog Develop, Super &amp; Mgmt</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 508</td>
<td>Intro to Dvplmnt Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>EDC 514 or EDC 561</td>
<td>Early Child Ed Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>EDC 539</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>EDC 603</td>
<td>Mntl Hlth in Med, Hu Srv, Lrn</td>
<td>3</td>
</tr>
<tr>
<td>EDC 604</td>
<td>Adverse Childhood Experiences</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours**

| Total Credit Hours | 30 |

**Program Notes:**

1. **Students** must complete program requirements with a minimum 3.0 gpa.

2. **Completion of this degree** leads to, but does not equate to certification through the Behavior Analyst Certification Board (BACB).

   a. In order to become a Board Certified Behavior Analyst (BCBA) a student must complete the required courses of this certificate, obtain supervision in an ABA setting, and successfully pass the BCBA exam.

      i. **ONSET OF EXPERIENCE:** Supervisees may not start accumulating experience hours until they have done all of the following: • Started qualifying coursework (may begin accruing hours after attending first class meeting) • Passed the Experience Standards Training Module • Secured a qualified supervisor

      ii. **DURATION OF EXPERIENCE:** The start and end dates of the experience may not be more than five years apart.

      iii. **ACCRUAL OF EXPERIENCE:** For all categories, no fewer than 10 hours but no more than 30 hours, including supervision hours, may be accrued per week. Supervisees may accrue experience in only one category per supervisory period.

3. In order to be eligible to take the BCBA exam and complete practicum hours, a student must complete all the required courses with a C or better.

4. More information regarding Behavior Analyst Certification can be found at [https://www.bacb.com/](https://www.bacb.com/).

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**Community Based Education**

The Masters of Arts in Community Based Education program is designed to serve two related professional fields:

1. **individuals working with, and for non-profit organizations engaged in educational outreach and**
2. **urban teachers who are working to build connections with the community as part of implementing place-based education strategies.**

In the College of Education, Health, and Human Services, there is an ongoing effort to connect community organizations with education and health and human services. The program will develop leaders who understand how issues of equity and diversity impact both schools and communities. Graduates will be equipped to act as leaders capable of transforming communities, engaging local citizens, and developing and
enacting educational experiences that empower children, youth and adults.

**Admission Requirements & Application**

Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor’s degree from an accredited institution
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
- Statement of purpose

Individuals who wish to apply for this program may initiate the application process online at: [http://umdearborn.edu/gradapplynow/](http://umdearborn.edu/gradapplynow/)

**Transfer of Credit**

A limit of six (6) credit hours can be transferred from a non-University of Michigan school and 15 credit hours of University of Michigan credit that are applicable to the program of study and approved by the program coordinator. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the Master of Arts in the Community Based Education program and successful completion of eight (8) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for transfer credit. Courses cannot be transferred for credit if: a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the M.A. in Community Based Education program; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

**Time Limits**

All coursework toward the master’s degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.

**Program of Study**

The Master of Arts in Community Based Education (CBE) is a 30 credit hour degree program. A minimum cumulative GPA of B (3.0 on a 4.0 scale) must be maintained to continue enrollment in the program. The CBE requires successful completion of the following courses:

**CBE Required Coursework**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 505</td>
<td>Adult Learning: Theory &amp; Practice</td>
<td></td>
</tr>
<tr>
<td>EDC 539</td>
<td>Child Maltreatment and Trauma</td>
<td></td>
</tr>
<tr>
<td>PADM 541</td>
<td>Fund Accounting</td>
<td></td>
</tr>
<tr>
<td>PADM 548</td>
<td>Fundraising</td>
<td></td>
</tr>
<tr>
<td>EDB 507</td>
<td>Strategic Communication for Admin</td>
<td></td>
</tr>
</tbody>
</table>

**Issues of Theory**

Select 2 of the following courses:

- EDA 501 | Adv Social Foundations of Ed                | 3            |
- EDA 620 | Public Pedagogy                             | 3            |
- EDB 500 | Multicultural Ed in US Classroom            |              |

**Issues of Research**

- EDK 500 | Intro to Research in Education              | 3            |
- EDB 583 | Program Evaluation                          | 3            |
- EDA 623 | Quantitative Research Methods               |              |
- EDA 625 | Qualitative Research Seminar                |              |

**Seminar and Research Project**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDK 680</td>
<td>Individual Res in Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 28

1. EDA 521 is a 1 credit hour course and must be taken 3 times over 3 semesters, for a total of 3 credit hours.

Contact the Office of Student Success at 313-593-5090 for additional information or consult the College of Education, Health, and Human Services web page at: [umdearborn.edu/cehhs/cehhs_masters/](https://umdearborn.edu/cehhs/cehhs_masters/)

**Early Childhood Education**

The Master of Arts in Early Childhood Education includes three program options for teachers, administrators, other service providers and educators who wish to learn how to serve young children and their families. The Early Childhood (25) Endorsement and the Early Childhood Special Education Inclusion options are for those who are already certified elementary teachers. The Early Childhood Administration and Leadership option is for non-certified professionals who are interested in early childhood leadership and administration. Courses are offered with the working professional in mind. Most courses required for the master’s degree are offered during evening and summer hours and include several online courses.

For additional information visit the College of Education, Health and Human Services’s website at: [umdearborn.edu/cehhs/cehhs_maeced/](http://umdearborn.edu/cehhs/cehhs_maeced/)

**Admission Requirements & Application**

Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor’s degree from an accredited institution
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
- Statement of purpose
Individuals who wish to apply for this program may initiate the process at:

umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/)

**Minimum Grade Point**

A cumulative grade point average of 3.0 (B) is required for continuation in the program. Courses in which grades of D, E, or U are earned cannot be used to fulfill degree requirements. Students whose cumulative grade point average falls below a 3.00 (B) will be placed on probation. Continued deficiencies will result in a required withdrawal from the program.

**Readmission**

Students not registered for classes within one calendar year must submit a readmission form. Approval for readmission must be obtained in order to register for classes.

**Residency Requirements and Time Limits**

Students seeking a master’s degree must fulfill the residency requirement by completing at least one-half of the degree in courses offered by the UM-Dearborn (see Transfer of Credit guidelines below). All coursework toward the master’s degree must be completed within five (5) consecutive years from the date of first enrollment in the program.

**Transfer of Credit**

Students may apply for transfer of credit of a maximum of fifteen semester hours from any University of Michigan campus or six semester hours from another accredited collegiate institution. Only graduate credit hours earned during the last five years that relate to the program and for which a grade of B or better was received can be considered for transfer. Transfer credit can be requested only after admission to the program and completion of eight hours of graduate-level letter graded coursework. Correspondence and extension courses, as well as Continuing Education Units (CEU) are not considered for transfer of credit. All courses to be transferred must be approved by the Director of Masters Degree Programs. A “Request for Transfer of Credit” form and an official copy of the transcript must be submitted. Enrolled students must obtain prior approval of the Director of Masters Degree Programs to elect classes off campus.

**Advising**

Students must plan their program with their assigned advisor. Contact the College of Education, Health, and Human Services at 313-593-5090 for an advising appointment.

**Exit Survey**

The purpose of the Exit Survey is to provide the College of Education, Health, and Human Services with valuable information for program evaluation and program development. The completion of the Exit Survey may provide the students with an opportunity for reflection, synthesis and evaluation of their educational experiences at UM-Dearborn.

The Exit Survey is required for program completion, but it is not graded. It is to be completed during the term in which the student is graduating from the program. The Exit Survey Form is available online at:

https://docs.google.com/a/umich.edu/forms/d/18PbL2NwB5UNUfoM- _jIJOvHb8dc0N3RaeWtu7ITOWs/edit (https:// docs.google.com/a/umich.edu/forms/d/18PbL2NwB5UNUfoM- _jIJOvHb8dc0N3RaeWtu7ITOWs/edit/)

**Graduation**

Once students apply to graduate a Degree Works audit will be completed by the Director of Masters Degree Programs. A diploma application must be submitted at the time of registration for the final semester.

**Program of Study**

The Master of Arts in Early Childhood Education is a 30 credit hour degree program that features three program options for teachers, administrators, or other service providers who wish to serve young children and their families.

Students are strongly recommended to elect at least one core class during the first year of work. Completion of all core classes is recommended within the first 20 credit hours. All core classes must be elected on the UM-Dearborn campus.

**The Master of Arts in Early Childhood Education with the Early Childhood (ZS) Endorsement**

The Master of Arts in Early Childhood Endorsement (ZS) program is designed for certified elementary teachers wishing to gain competency in the general and special education of young children birth to eight. This program provides an inquiry-based constructionist early childhood curriculum development and an inclusive trans-disciplinary approach to early childhood education. A minimum of 30 credit hours is required. This program requires fieldwork (EDD 594 Internship) at the UM-Dearborn Early Childhood Education Center during a summer semester.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Coursework:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDC 540</td>
<td>Advanced Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 645</td>
<td>Transdisc Appr Assess/Collab</td>
<td>3</td>
</tr>
<tr>
<td>EDK 500</td>
<td>Intro to Research in Education</td>
<td>3</td>
</tr>
<tr>
<td><strong>Professional Studies:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDB 522</td>
<td>Lead Advoc Admin Early Child</td>
<td>3</td>
</tr>
<tr>
<td>EDC 531</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 542</td>
<td>EC:Fam/Sch/Com Collab Mult Soc</td>
<td>3</td>
</tr>
<tr>
<td>EDC 545</td>
<td>Develop Assess of Young Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 536</td>
<td>Grad Sem in Early Childhood Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDD 546</td>
<td>Intervention Strat EC Spec Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDD 594</td>
<td>Early Childhood Ed Internship</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

1 EDC 645 requires prerequisite course EDC 414 or 514, or permission of instructor
2 EDD 546 requires a prerequisite undergraduate course in teaching children with special needs or elect EDC 514 or EDC 561 to fulfill the prerequisite.
3 EDD 594 requires the prerequisite course EDD 536
Masters of Arts with Early Childhood Special Education Inclusion

The Master of Arts in Early Childhood Education with Early Childhood Special Education Inclusion is a non-endorsement program for teachers holding an Early Childhood (ZA/ZS) endorsement. The unique internship opportunities offered in partnership with the Early Childhood Education Center and the Oakwood Center for Exceptional Families focus on inclusive early childhood theories and practices. The program provides significant knowledge and skills for teaching children with disabilities using a trans-disciplinary inclusive approach. A minimum of 30 credit hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 540</td>
<td>Advanced Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDC 645</td>
<td>Transdisc Appr: Assess/Collab</td>
<td>3</td>
</tr>
<tr>
<td>EDB 500</td>
<td>Intro to Research in Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 531</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 539</td>
<td>Child Maltreatment and Trauma</td>
<td>3</td>
</tr>
<tr>
<td>EDC 546</td>
<td>Cog/Memory Dev in Children</td>
<td>3</td>
</tr>
<tr>
<td>EDD 536</td>
<td>Grad Sem in Early Childhood Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDD 546</td>
<td>Intervention Strat EC Spec Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDD 650</td>
<td>Internship ECSE</td>
<td>3</td>
</tr>
<tr>
<td>PDED 505</td>
<td>Sp Ed Legisltn and Litigation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credit Hours</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Note: Undergraduate and graduate transcripts will be evaluated for courses relevant to Early Childhood Education Inclusion.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB 522</td>
<td>Lead Advoc Admin Early Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 536</td>
<td>Grad Sem in Early Childhood Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDB 537</td>
<td>Administrative Intern in EC</td>
<td>3</td>
</tr>
<tr>
<td>PDED 505</td>
<td>Sp Ed Legisltn and Litigation</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

Choose four courses from the following: 12

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB 540</td>
<td>School Budgeting and Finance</td>
<td>3</td>
</tr>
<tr>
<td>EDB 560</td>
<td>Admin of Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>EDC 531</td>
<td>Constructivist Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 540</td>
<td>Advanced Child Development</td>
<td>3</td>
</tr>
<tr>
<td>EDT 585</td>
<td>Technology for Administrators</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 30

Note: Undergraduate and graduate transcripts will be evaluated for courses relevant to Early Childhood Administration and Leadership.

Master of Arts in Early Childhood for Early Childhood Administration and Leadership

The Master of Arts in Early Childhood Education for Early Childhood Administration and Leadership program is designed for non-certified professionals who are interested in early childhood leadership and administration. In the Early Childhood field there is a growing need for administrators and leaders in early childhood. This program will serve professionals (Directors, Education Coordinators and Curriculum Specialists) who need further preparation in supervision, and field experience in administration and leadership. A minimum of 30 credit hours is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDED 505</td>
<td>Sp Ed Legisltn and Litigation</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Undergraduate and graduate transcripts will be evaluated for courses relevant to Early Childhood Administration and Leadership.

Master of Arts in Early Childhood (MAEC)

The Master of Arts in Early Childhood (MAEC) degree program is designed to meet the critical need for educational leaders who can transform education at the PK-12, community college and university levels. The Education Specialist (EdS) degree is an advanced professional degree program that assists veteran educators to enhance their knowledge of theory and best practice, to acquire skills in interpreting and using educational...
scholarship and research, and to understand processes of change and leadership in education settings. The degree program is ideal for educators who seek new skills and new opportunities for leadership and for those seeking the Michigan Central Office Administrator Certificate.

Coursework can be completed on either a full or part time basis. Three courses for a total of 9 credits will be in the core areas; an additional 18 credits will be in one of three concentration areas that will specifically target their professional interests. The final 3 credits will focus on an applied studies or research project. The three concentration areas are: Educational Leadership, Metropolitan Education, and Curriculum and Practice.

Doctorate in Education (Ed.D.)
The Doctorate in Education (Ed.D.) degree is designed for working professionals who aspire to be leaders in education. Students will complete 60 credit hours beyond a Master’s degree in course and field work that lead to the Ed.D. degree. Students may count credits earned toward the completion of a specialist’s degree, either from the University of Michigan – Dearborn or another accredited institution of higher education, toward the completion of their Ed.D. degree. Students who have completed the Ed.S. degree at the University of Michigan – Dearborn and subsequently been admitted to the Ed.D. program will need to complete a minimum of 30 additional credit hours to earn an Ed.D. The determination of what courses need to be taken to complete the program will be the responsibility of the student’s doctoral advisor. Students who have completed an Ed.S. degree at another institution and subsequently been admitted to the Ed.D. program will need to complete a minimum of 36 additional credit hours to earn an Ed.D. The determination of what courses need to be taken to complete the program will be the responsibility of the student’s doctoral advisor.

Coursework can be completed on either a full or part time basis. Eight classes for a total of 24 credits will be in the core areas; an additional 24 credits will be in one of three concentration areas that will specifically target students’ professional interests. The final 12 credits will focus on dissertation research or an applied studies project. The three concentration areas are: Educational Leadership, Metropolitan Education, and Curriculum and Practice.

Admission Requirements & Application
Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor’s degree from an accredited institution
- A cumulative grade point average of 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
- Statement of purpose
- Valid state of Michigan teaching certificate required if seeking an additional endorsement

Individuals who wish to apply for this program may initiate the application process online at: umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/)

Minimum Grade Point
A cumulative grade point average of 3.0 (B) is required for continuation in the program. Courses in which grades of D, E, or U are earned cannot be used to fulfill degree requirements. Students whose cumulative grade point average falls below a 3.00 (B) will be placed on probation. Continued deficiencies will result in a required withdrawal from the program.

Readmission
Students not registered for classes within one calendar year must submit a readmission form. Approval for readmission must be obtained in order to register for classes.

Time Limit
All coursework toward the master’s degree must be completed within five (5) consecutive years from the date of first enrollment in the program.

Transfer of Credits
Students may apply for transfer of credit of a maximum of fifteen semester hours from any University of Michigan campus or six semester hours from another accredited collegiate institution. Only graduate credit hours earned during the last five years that relate to the program and for which a grade of B or better was received can be considered for transfer. Graduate credit may be transferred from other accredited degree-granting universities with graduate degree programs for up to a maximum of 6 credit hours, or their equivalent. For universities on the quarter system, 9 credit hours is the equivalent of 6 semester credit hours. Graduate credit may be transferred from other University of Michigan campuses (Flint or Ann Arbor) for up to half the credits required for the degree. Enrolled students must obtain prior approval of the Director of Masters Degree Programs to elect classes off campus.

Program Requirements
This 30 (minimum) semester hour master’s degree is divided into two parts: 1) Core Courses and 2) Professional Studies. Considerable flexibility is available in the professional studies area to satisfy individual interests and needs.

Core Courses
The core sequence provides continuity and integration for all programs. Ideas of policy, change, growth and diversity are developed in the following courses.

Nine credit hours in the Core are required for all.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 501</td>
<td>Adv Social Fndations of Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDC 556</td>
<td>Learning &amp; Classrm Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDK 500</td>
<td>Intro to Research in Education</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 9

Professional Studies
The professional studies courses are offered through the College of Education, Health, and Human Services. These courses are to be selected with the advisor’s approval in consideration of the student’s academic background and/or teaching assignments. The number of credits within this category varies.

Professional studies courses may be selected to enhance the student’s current areas of specialty in elementary or secondary education or to obtain an additional area of specialization. These courses may be used to
add an endorsement to the certificate. If so, students must meet all the State of Michigan and UM-Dearborn certification requirements for that major or minor. Only courses required for the major or minor, which are approved for graduate credit, may be applied toward the MA program. Professional studies courses may also be used toward meeting the requirements for State teaching endorsements.

Details concerning the requirements and the appropriate coursework can be obtained from the student’s assigned advisor or from the College of Education, Health, and Human Services Office of Student Success. A more definitive description of the program is available from the College of Education, Health and Human Service's webpage at: umdearborn.edu/cehhs/cehhs_maed/ (http://umdearborn.edu/cehhs/cehhs_maed/)

Advising

Students must plan their program with their assigned advisor. Contact the College of Education, Health, and Human Services at 313-593-5090 for an advising appointment.

Exit Survey

The purpose of the Exit Survey is to provide the College of Education, Health, and Human Services with valuable information for program evaluation and program development. The completion of the Exit Survey may provide the students with an opportunity for reflection, synthesis and evaluation of their educational experiences at UM-Dearborn.

The Exit Survey is required for program completion, but it is not graded. It is to be completed during the term in which the student is graduating from the program. The Exit Survey Form is available online at:

https://docs.google.com/a/umich.edu/forms/d/18PbL2NwB5UNUfoM-_jUJoHBd8dc0N3Ra2wu7l0TWs/edit (https://docs.google.com/a/umich.edu/forms/d/18PbL2NwB5UNUfoM-_jUJoHBd8dc0N3Ra2wu7l0TWs/edit)

Graduation

Once students apply to graduate a Degree Works audit will be completed by the Director of Masters Degree Programs. A diploma application must be submitted at the time of registration for the final semester.

Program Options in the Master of Arts in Education

No Additional Endorsement Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/no-endorsement/)

English as a Second Language (ESL) Endorsement Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/esl/)

Reading Specialist K-12 Endorsement Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/reading-specialist/)

Teaching English to Speakers of Other Languages (TESOL) Option (http://catalog.umd.umich.edu/graduate/college-education-health-human-services/education/tesol/)

Admission

Minimum requirements for admission in the EdS program include:

1. A Master's degree from an accredited institution of higher education with at least an overall 3.3 on a four point scale or equivalent.

2. Official copies of transcripts of all undergraduate and graduate coursework.

3. Applicants whose native language is not English must demonstrate English proficiency and are required to provide an official score report of an accepted English Proficiency Test. See umdearborn.edu/684363/ (http://umdearborn.edu/684363/) for details.

4. At least three years teaching experience or the equivalent experience working in a professional setting.

5. Three recommendation letters from faculty and/or employer. Standard questions will be asked of all references and may include:
   - Potential for quality doctoral work
   - Potential for leadership impact in the field upon completion of the program
   - Other areas may be included such as: collegiality, ability to complete quality work on time, work etc.

6. A letter or statement of academic interests, professional goals and the applicant's personal/unique potential for contribution to a student cohort.

7. The application fee is $60.00 USD.

Satisfactory Progress Towards a Degree

Each EdS student is expected to maintain satisfactory progress towards the degree by maintaining a “B” average in coursework. Students who fall below a “B” grade point average in any one term will be placed on academic probation and notified of this in writing. Students who do not make satisfactory progress may be removed from the program in writing. Policies established by CEHHS will determine criteria for disqualification from the program.

Readmission

Students not registered for classes within one calendar year must submit a readmission form to the EdS program coordinator. Approval for readmission must be obtained in order to register for classes.

Residency Requirements

Students seeking an EdS degree fulfill the residency requirement by completing at least one-half of their degree in courses offered by the University of Michigan-Dearborn (see Transfer of Credit guidelines below). All coursework toward the Central Office Administration Certificate must be completed within five consecutive years from the date of first enrollment in the program.

Normative Time from Matriculation to Degree

Total registered time in the program is not expected to exceed five years, but an extension can be requested by the student.
Transfer of Credit

Courses may receive transfer credit if:

- Graduate credits were completed within five years of application to the EdS program at another accredited institution.
- Graduate credits were completed at another University of Michigan School or College (including Flint and Ann Arbor).
- Graduate Extension courses were completed at any of these campuses; the University of Michigan, Wayne State University, Michigan State University, Western Michigan University, Central Michigan University, Eastern Michigan University, Northern Michigan University, and Oakland University.
- Courses were taken at an undergraduate institution, only if students completed the course during their junior or senior year and they were approved for graduate credit by the graduate school of the institution where and when the student took the course; and the courses were not used in whole or in part, in any way, to meet requirements for a degree, and the student’s program advisor approves the transfer of the course.

Up to six credit hours from another (non University of Michigan) accredited university will be accepted as transfer credits; however, the EdS program coordinator must approve the acceptance of transfer credits. Students may transfer up to one-half (1/2) the minimum number of credit hours required for the EdS degree from the Ann Arbor and Flint University of Michigan campuses.

Program Requirements

The 30 (minimum) semester hour specialist degree is divided into three parts: 1) Core Courses, 2) Concentration Area Courses, and 3) Research or Applied Studies Project. Considerable flexibility is available in the concentration areas to satisfy individual interests and needs. Courses leading to the Michigan Department of Education Central Office Administrator Certificate are available to students who choose the Educational Leadership concentration.

Core Courses

The core courses are designed to provide students with a global perspective of education in contemporary schools and to prepare them for higher-level courses in the specialization area.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 740</td>
<td>Seminar in Ed Psych/Spec Educ</td>
<td>3</td>
</tr>
<tr>
<td>EDB 722</td>
<td>Seminar in Educ Leadership</td>
<td>3</td>
</tr>
<tr>
<td>EDD 717</td>
<td>Sem in Curriculum and Practice</td>
<td>3</td>
</tr>
<tr>
<td>EDA 725</td>
<td>Seminar in Metropolitan Educ</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDK 823</td>
<td>Quantitative Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>EDK 825</td>
<td>Qualitative Research Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 9

Note: An Introduction to Research course must have been completed and credited on graduate transcript to enroll in one of the above research courses or must be completed prior to enrolling in EDK 823 or EDK 825.

Concentration Area Courses (18 hrs)

Six specialist level courses must be selected in the area of concentration with the guidance of the student’s respective EdS program advisor. The professional studies courses are offered through the College of Education, Health, and Human Services and other units of the University. Students will work with their faculty advisor to determine which concentration area courses are appropriate to the student’s needs and professional goals.

Action Research Studies (3 hrs)

Students will complete an action research project with approval of their advisor following successful completion of the core and concentration area courses.

Central Office Administration Certificate Program

The Central Office Administration Certificate Program is designed to prepare students for roles in PK-12 school district central office administration/leadership. The program is approved by the Michigan Department of Education and meets MDE Standards for the Preparation of Central Office Administrators. Upon successful completion of the program, students will be eligible for recommendation to the Michigan Department of Education for the Central Office Administration Certificate.

The Central Office Administration Certificate Program can be obtained in one of the three following ways:

- In conjunction with the Education Specialist (Ed.S.) degree program,
- In conjunction with the Education Doctoral (Ed.D.) degree program,
- As a stand-alone certificate.

The program curriculum emphasizes the knowledge and skill base required to meet the opportunities and challenges of central office leadership in PK-12 school systems. The courses are designed to develop educational leadership competency and skills in organizational development, labor relations, human resource development, strategic planning, applications of technology, policy development, school community relations, data analysis, legal and regulatory issues, and evaluation of programs. An internship in central office administration is required in the final year of the program. Courses are offered in the evening, on-line, and Saturdays to accommodate the working professional.

Admission Requirements

Eligibility for admission to the Central Office Administration Certificate program requires a bachelor’s degree from an accredited college or university with an undergraduate GPA of 3.0 or better on a 4.0 scale, a valid elementary or secondary teaching certificate, a minimum of three years classroom teaching experience, completion of a master’s degree in educational administration/leadership with a GPA of 3.3 or better on a 4.0 scale, and a valid K-12 school administration certificate. Upon successful completion of the program, students will be eligible for recommendation to the Michigan Department of Education for the Michigan Department of Education Central Office Administrator Certificate.
Application Process

Formal application to the Central Office Administration Certificate Program must be submitted to the College of Education, Health, and Human Services Educational Leadership Program. Applications are available on-line at the College of Education, Health, and Human Services web site or can be obtained at the College of Education, Health, and Human Services Office of Student Success. Applications should be completed and submitted to the College of Education, Health, and Human Services Office of Student Success along with the following supporting materials:

1. Official copy of the applicant’s baccalaureate degree transcript;
2. Official copy of the applicant’s master’s degree transcript;
3. Official transcripts from all other colleges or universities attended;
4. A copy of the applicant’s current Michigan Teaching Certificate;
5. A copy of the applicant’s current Michigan School Administrator Certificate;
6. Three letters of recommendation attesting to the applicant’s quality level of graduate work, potential for leadership impact in the field upon completion of the program, and other area related to ability to complete the program;
7. A one page Statement of Purpose including academic interests, professional goals, and personal/unique potential for contribution to the field of central office administration;
8. A $60.00 non-refundable application fee.

The Statement of Purpose should be a concise, well written essay addressing applicant’s educational background, academic interests, career goals, and service to PK-12 schools. For specific questions regarding the program or application process, applicants are invited to contact the Office of Student Success at 313-593-5090.

Transfer of Credit

A limit of six (6) credit hours that are applicable to the program of study and approved by the program coordinator can be transferred from a non-University of Michigan accredited college or university. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the Central Office Administration Certificate program and successful completion of six (6) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for transfer credit. Courses cannot be transferred for credit if: a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the certificate program; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

Residency Requirements and Time Limits

Students seeking a Central Office Administration Certificate fulfill the residency requirement by completing at least one-half of their degree in courses offered by the University of Michigan-Dearborn (see Transfer of Credit guidelines). All coursework toward the Central Office Administration Certificate must be completed within six consecutive years from the date of first enrollment in the program. Students whose grade point average falls below a B (3.0 on a 4.0 scale) will be placed on probation. Continued deficiencies will result in a required withdrawal from the program.

Coursework

A minimum cumulative GPA of 3.0 on a 4.0 scale must be maintained to continue enrollment in the program. Candidates must hold a valid and current elementary or secondary teaching certificate and a valid and current school administrator certificate. The program requires successful completion of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB 721</td>
<td>Central Office Internship</td>
<td>2-3</td>
</tr>
<tr>
<td>EDB 722</td>
<td>Seminar in Educ Leadership</td>
<td>3</td>
</tr>
<tr>
<td>EDB 724</td>
<td>Superintendenty</td>
<td>3</td>
</tr>
<tr>
<td>EDB 725</td>
<td>Leadership Ethics</td>
<td>3</td>
</tr>
<tr>
<td>EDB 762</td>
<td>Labor Rel in School Setting</td>
<td>3</td>
</tr>
<tr>
<td>EDB 807</td>
<td>Strategic Comm for Admin</td>
<td>3</td>
</tr>
<tr>
<td>EDB 861</td>
<td>Organization Dev &amp; Theory</td>
<td>3</td>
</tr>
<tr>
<td>EDB 881</td>
<td>Strategic Ping/Needs Assess</td>
<td>3</td>
</tr>
<tr>
<td>EDB 882</td>
<td>Policy Analysis &amp; Development</td>
<td>3</td>
</tr>
<tr>
<td>EDT 785</td>
<td>Technology for Administrators</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>29-30</td>
</tr>
</tbody>
</table>

The Internship in Central Office Administration requires sustained practice in multiple central office positions under the mentorship of a practicing central office administrator. This program remains under ongoing review to insure quality and compliance with University and Michigan Department of Education standards and requirements. Contact the Office of Student Success at 313-593-5090 for additional information or consult the College of Education, Health, and Human Services web page at: umdearborn.edu/cehhs/cehhs_eds_ed_leadership/ (http://umdearborn.edu/cehhs/cehhs_eds_ed_leadership/)

Advising

Students must plan their program with their assigned advisor or with the EdS Program Coordinator. Contact the College of Education, Health, and Human Services at 313-593-5090 for an advising appointment.

Petition

All graduate policies have been formulated by the UM-Dearborn College of Education, Health, and Human Services with the goal toward academic quality. This goal requires that policies be equitably and uniformly applied. However, there may be an infrequent extenuating circumstance that warrants individual consideration. In such a case, a petition to waive or modify a policy may be filed by the specialist student. Please contact the Office of Student Success for information and forms regarding the petition process.

Graduation

A diploma application must be submitted at the time of registration for the final semester.

Admission

Minimum requirements for admission in the Ed.D. program include:
1. Completion of a master's degree from an accredited institution. Official copies of transcripts of all undergraduate and graduate coursework.

2. Applicants whose native language is not English must demonstrate English proficiency and are required to provide an official score report of an accepted English Proficiency Test. See umdearborn.edu/684363/ (http://umdearborn.edu/684363/) for details.

3. Applicants must submit scores on the analytical, quantitative and verbal tests of the Graduate Record Examinations (GRE). Scores may not be more than five years old.

4. At least three years teaching experience or the equivalent experience working in a professional setting.

5. Three recommendation letters from faculty and/or employers. Standard questions will be asked of all references and may include:
   • Potential for quality doctoral work
   • Potential for leadership impact in the field upon completion of the program
   • Other areas may be included such as: collegiality, ability to complete quality work on time, work etc.

6. A letter or statement of academic interests, professional goals and the applicant's personal/unique potential for contribution to a doctoral cohort.

7. Applications are due annually on March 1 in order to be considered for admission in the Ed.D. program. Applicants may be interviewed by the Ed.D. committee as part of the selection process.

8. The application fee is $60.00 USD.

Once applicants have met all of the admissions requirements through step 8 they may be contacted to arrange for a personal interview with a member of the Ed.D. Faculty Advisory Committee. The interview may be conducted over the telephone or via Skype for students traveling from out of state. During the interview, the applicant can be expected to demonstrate evidence of personal commitment to earn a doctoral degree, evidence of personal professional goals that are aligned with the goals of the Ed.D. program and evidence of professional behavior.

Meeting the minimum requirements qualifies an applicant for admissions consideration but does not guarantee admission to the program. Admissions will be granted on a competitive basis.

Individuals who wish to apply for the Doctorate in Education may obtain application and recommendation forms from the website at: umdearborn.edu/cehhs/cehhs_edd/ (http://umdearborn.edu/cehhs/cehhs_edd/)

Satisfactory Progress Towards Degree

Each doctoral student is expected to maintain satisfactory progress towards the degree by maintaining a “B” average in coursework and passage of all required examinations within two attempts. Students who fall below a “B” grade point average in any one term will be placed on academic probation and notified of this in writing. Students who do not make satisfactory progress may be removed from the program in writing. CEHHS and the Ed.D Faculty Advisory Committee will determine criteria for disqualification from the program.

Readmission

Students not registered for classes within one calendar year must submit a readmission form to the doctoral program coordinator. Approval for readmission must be obtained in order to register for classes.

Residency Requirements

While there will be no formal residency requirement for part-time students, it is expected that they will participate in doctoral program activities on campus or through online discussions. This involvement will foster intellectual development and provide a supportive environment for all program participants.

Normative Time from Matriculation to Degree

The Ed.D. program is designed for completion of the degree requirements at a minimum of three calendar years. However, circumstances may require students to take fewer courses each term. As a result, flexibility is built into the program. Total time to qualifying examination and advancement to candidacy should not normally exceed three years, but students can request additional time. A request for extension needs to be submitted to the Ed.D. Faculty Advisory Committee.

Total registered time in the program is not expected to exceed six years, but again, an extension can be requested by the student.

Transfer of Credit

Courses may receive transfer credit if:

• Graduate credits were completed within five years of application to the Ed.D. program at another accredited institution.
• Graduate credits were completed at another University of Michigan School or College (including Flint and Ann Arbor).
• Graduate Extension courses were completed at any of these campuses: the University of Michigan, Wayne State University, Michigan State University, Western Michigan University, Central Michigan University, Eastern Michigan University, Northern Michigan University, and Oakland University.
• Courses were taken at an undergraduate institution, only if students completed the course during their junior or senior year and they were approved for graduate credit by the graduate school of the institution where and when the student took the course; and the courses were not used in whole or in part, in any way, to meet requirements for a degree, and the student’s doctoral program adviser approves the transfer of the course.

Up to six credit hours from another (non University of Michigan) accredited university will be accepted as transfer credits; however, the Ed.D. advisor must approve the acceptance of transfer credits. Students may transfer up to one-half (1/2) the minimum number of credit hours required in the coursework for the core and concentration classes in the Ed.D. degree from the Ann Arbor and Flint University of Michigan campuses.

Program Requirements

The 60 (minimum) credit hour doctoral degree is divided into three parts:
1) Core Courses (24 credit hours), 2) Concentration Area Courses (24 credit hours), and 3) Dissertation Research or Applied Studies Project
(12 credit hours). Considerable flexibility is available in the concentration areas to satisfy individual interests and needs.

**Core Courses (24 credit hours)**
The core courses are designed to provide students with a global perspective of education in contemporary schools and to prepare them for higher-level courses in the specialization area.

### Code | Title | Credit Hours
--- | --- | ---
EDA 725 | Seminar in Metropolitan Educ | 3
EDB 722 | Seminar in Educ Leadership | 3
EDC 740 | Seminar in Ed Psych/Spec Educ | 3
EDD 717 | Sem in Curriculum and Practice | 3
EDK 700 | Intro to Research in Education | 3
EDK 823 | Quantitative Research Methods | 3
EDK 825 | Qualitative Research Seminar | 3
EDK 850 | Resrch Dsgn & Proposal Dvlpmnt | 3

Total Credit Hours: 24

All eight core courses or their equivalent must be completed. Any substitution of course(s) for a core course(s) must be approved in writing by the doctoral program advisor before the qualifying exam.

**Concentration Area Courses (24 credit hours)**
Eight graduate/doctorate level courses must be selected in the area of concentration with the written approval of the student’s Ed.D. program advisor. The concentration area courses are offered through the College of Education, Health, and Human Services and other units of the University. Students will work with their advisor to determine which concentration area courses are appropriate to the students’ needs and professional goals.

**Qualifying Examination**
The qualifying examination is generally taken one semester after the completion of course work upon recommendation of the student’s advisor. Students must be at a point in their studies where students’ mastery of the core course work and concentration area can be fairly evaluated. The qualifying exam will be a written assessment of student knowledge.

Unanimous agreement of the qualifying examination committee is required for the student to pass the examination. Students who do not pass on the first attempt have only one other opportunity to take the examination. At least three months must pass before the second attempt and no more than one calendar year. The committee may suggest additional coursework to address weak areas.

**Proposal Defense (12 credit hours)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDK 992</td>
<td>Dissertation/Applied Study</td>
<td>1-4</td>
</tr>
</tbody>
</table>

The proposal defense is taken after students have successfully completed their coursework. The proposal defense is a hearing on the student’s proposal. Typically the same review team for the qualifying examination is used for the entire Dissertation or Applied Studies Committee who must be present during the proposal defense and approve the proposal unanimously.

Although the examination is usually an oral hearing, the committee may require that students respond in writing to questions and/or make revisions in their proposals as a condition of approval. If the student is required to resubmit the proposal, the committee will review the revised proposal and communicate the outcome to the student in writing. The student must receive written approval of the proposal by the committee and written notification by the Institutional Review Board that human subjects review requirements have been met before beginning dissertation or applied studies work.

The proposal must demonstrate a strong scholarly and professional foundation of knowledge and the ability to apply the knowledge to rigorous study of an issue in K-12, community college, or university level education. The student must submit the dissertation or applied studies proposal for approval following the format and procedures established by the Ed.D. Faculty Advisory Committee. At a minimum, the proposal will contain a description of the problem, a review of the relevant literature, a statement of the question being answered and a description of the research methodology or approach taken to address the question. The proposal must also contain the materials that have been or will be submitted to the Institutional Review Board to meet human subjects requirements.

**Dissertation/Applied Studies**

Following successful completion of the qualifying exam and proposal defense, the focus will be on the preparation for the dissertation research or applied studies project. This culminating work may focus on a wide range of topics and/or research methods. Whether the candidate decides to do a dissertation or applied studies project, the work will focus on a significant professional problem or issue and have the potential to contribute in a general way or in the context of a particular educational setting to the improvement of PK-12, community college, or university level education.

**Candidacy**

A student will become a candidate for the Ed.D. degree after completing the required coursework with a minimum GPA of B and after passing the qualifying examination and proposal defense. At this point, the student will be allowed to pursue the dissertation or applied studies work.

**Dissertation/Applied Studies Project**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDK 992</td>
<td>Dissertation/Applied Study</td>
<td>1-4</td>
</tr>
</tbody>
</table>

The student must submit a written copy of the dissertation or applied studies project to the dissertation/applied studies committee for approval before the oral defense will be scheduled. All members of the dissertation or applied studies committee are responsible for reading the dissertation or applied studies documents and submitting their written evaluations to the committee chair at least one week prior to the defense.

**Oral Defense of Dissertation/Applied Studies Project**

The final oral examination is the candidate’s defense of the dissertation or applied studies project. The dissertation/applied studies committee members conduct the oral examination. The final oral examination will be open to other faculty, students and interested public. The dissertation/ applied studies committee members must be present at the oral defense. Unanimous agreement of the committee is required for approval of the dissertation/applied study and recommendation that the Ed.D. degree be awarded. If the committee requires substantive changes to the written
Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor’s degree from an accredited institution
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form

Admission Requirements

- Statement of purpose
- State of Michigan Teaching Certificate

Individuals who wish to apply for this program may initiate the application process online at: umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/)

Transfer of Credit

A limit of six (6) credit hours can be transferred from a non-University of Michigan school and 15 credit hours of University of Michigan credit that are applicable to the program of study and approved by the program coordinator. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the Master of Arts in Educational Leadership program and successful completion of six (6) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for transfer credit. Courses cannot be transferred for credit if: a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the MAEL program; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

Time Limits

All coursework toward the master’s degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.

Program Requirements

The Master of Arts in Educational Leadership (MAEL) is a 33 credit hour degree program. A minimum cumulative GPA of B (3.0 on a 4.0 scale) must be maintained to continue enrollment in the program. Candidates must hold a valid elementary or secondary teaching certificate. The MAEL requires successful completion of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB 505</td>
<td>Intro to Educ Administration</td>
<td>3</td>
</tr>
<tr>
<td>EDB 501</td>
<td>Leadership and Administration</td>
<td>3</td>
</tr>
<tr>
<td>EDB 540</td>
<td>School Budgeting and Finance</td>
<td>3</td>
</tr>
<tr>
<td>EDB 560</td>
<td>Admin of Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>EDB 583</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>EDB 502</td>
<td>School and Community Relations</td>
<td>3</td>
</tr>
<tr>
<td>EDB 523</td>
<td>Legal and Reg Issues in Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDB 586</td>
<td>Curriculum Delib and Develop</td>
<td>3</td>
</tr>
<tr>
<td>EDT 585</td>
<td>Technology for Administrators</td>
<td>3</td>
</tr>
<tr>
<td>EDB 720</td>
<td>Internship 1</td>
<td>3</td>
</tr>
<tr>
<td>EDB 720</td>
<td>Internship 1</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 33

1. This internship must be repeated for up to a total of 6 credit hours.

This program remains under on-going review to insure quality and compliance with University and Michigan Department of Education standards and requirements. Contact the Office of Student Success at 313-593-5090 for additional information or consult the College of
Eligibility for regular admission includes:

- Completion of a bachelor's degree from an accredited institution
- Official transcript(s) from each college/university attended
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
- Statement of purpose
- Valid state of Michigan teaching certificate if seeking the Educational Technology endorsement

Admission Requirements & Application

Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
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- Three professional letters of recommendation using required form
- Statement of purpose

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Transfer of Credit

A limit of six (6) credit hours can be transferred from a non-University of Michigan school and 15 credit hours of University of Michigan credit that are applicable to the program of study and approved by the program coordinator. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the School Principal Certificate program and successful completion of six (6) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for transfer credit. Courses cannot be transferred for credit if:

- a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the School Principal Certificate program; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

Residency Requirements and Time Limits

Students seeking a School Principal Certificate must fulfill the residency requirement by completing at least one-half of their degree in courses offered by the University of Michigan-Dearborn. All coursework toward the School Principal Certificate must be completed within five consecutive years from the date of first enrollment in the graduate program. Students whose grade point average falls below a B (3.0 on a 4.0 scale) will be placed on probation. Continued deficiencies will result in a required withdrawal from the certificate program.

Educational Technology (EDET)

The Masters of Arts in Educational Technology program is designed for educators interested in developing expertise in the effective use of various forms of educational technology in teaching and learning. The program can be completed fully online and offers professionals advanced knowledge in a broad range of educational technologies. In addition, students will learn how to integrate technology across the curriculum in face-to-face, hybrid and online settings. Individuals who teach in K-12 schools, colleges and universities, private industry and other instructional settings will find this program useful for increasing their overall effectiveness in the field of educational technology and their ability to utilize proven pedagogical practices.

Admission Requirements

The School Principal Certificate program of study can be earned with or without the Master of Arts in Educational Leadership (MAEL). Applicants without a master’s degree must enroll in the MAEL in order to earn this certificate. Applicants with a master’s degree may enroll in the certificate program. Eligibility for admission to the School Principal Certificate program requires a master’s degree from an accredited college or university with a graduate GPA of 3.0 or better on a 4.0 scale and a valid elementary or secondary teaching certificate.

Transfer of Credit

A limit of six (6) credit hours can be transferred from a non-University of Michigan school and 15 credit hours of University of Michigan credit that are applicable to the program of study and approved by the program coordinator. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the School Principal Certificate program and successful completion of six (6) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for transfer credit. Courses cannot be transferred for credit if:

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Admission Requirements & Application

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- a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the School Principal Certificate program; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

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- Completed application form
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- Official transcript(s) from each college/university attended
- Completion of a bachelor's degree from an accredited institution
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
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- Valid state of Michigan teaching certificate if seeking the Educational Technology endorsement

Individuals who wish to apply for this program may initiate the application process online at: umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/)
Holders of the certificate may become leaders in their schools or school districts in adopting STEM² programs or may serve as a resource for other teachers who wish to integrate STEM² activities into the curricula. The UM-Dearborn certificate requires students to elect 12-13 hours of graduate level credits. Students will have several options depending on their science and mathematics background.

**Time Limits**
Students must complete the certificate program within three years, from the date of first enrollment.

**Admission Requirements**
All applicants must submit evidence of each of the following to the Office of Student Success along with a completed Post-Degree Application Form found at:

http://umdearborn.edu/cehhs/grad-stemm-cert/

• Completion of a bachelor’s degree at an accredited institution.
• A 3.0 or higher grade point average (GPA is based on a 4.0).
• An official transcript from college or university granting the undergraduate degree and one from each college or university attended.
• Submit a completed Post-Degree Application Form and non-refundable $30.00 application fee (payable by check or money order to University of Michigan-Dearborn). This fee is waived for applicants who have previously paid an application fee to any University of Michigan campus.

**Minimum Grade Point**
• Completion of the required coursework with a GPA of at least 3.0

For more information, call 313-593-5090 or visit: umdearborn.edu/cehhs/grad-stemm-cert/

**Program Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDT 501</td>
<td>Rsrch, Trnds&amp;Iss in Ed Tchnlgy</td>
<td>3</td>
</tr>
<tr>
<td>EDT 502</td>
<td>Survey of Educ Tech Tools</td>
<td>3</td>
</tr>
<tr>
<td>EDT 510</td>
<td>Teaching with Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDT 514</td>
<td>Application of Instrl Design</td>
<td>3</td>
</tr>
<tr>
<td>EDT 520</td>
<td>Intro to Teaching/Learn Online</td>
<td>3</td>
</tr>
<tr>
<td>EDT 522</td>
<td>Educating the Digital Learner</td>
<td>3</td>
</tr>
<tr>
<td>EDT 531</td>
<td>Lead. &amp; Prof. devel in Ed Tech</td>
<td>3</td>
</tr>
</tbody>
</table>

**Foundational Masters Classes**
Select 3 courses: 9

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 501</td>
<td>Adv Social Fndations of Ed</td>
<td></td>
</tr>
<tr>
<td>EDC 505</td>
<td>Adult Lrning:Theory &amp; Practice</td>
<td></td>
</tr>
<tr>
<td>EDC 556</td>
<td>Learning &amp; Classrm Assessment</td>
<td></td>
</tr>
<tr>
<td>EDC 560</td>
<td>Rdg:Dia/Assessment Tech K-12</td>
<td></td>
</tr>
<tr>
<td>EDK 500</td>
<td>Intro to Research in Education</td>
<td></td>
</tr>
<tr>
<td>EDT 530</td>
<td>Assistive Technology</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 30

Contact the Office of Student Success at 313-593-5090 for additional information or consult the College of Education, Health, and Human Services web page at: umdearborn.edu/cehhs/ma_ed_tech/

**Graduate STEM² Teaching Certificate**
The Graduate Certificate of STEM² Teaching is designed to enhance students’ content knowledge in science, technology, engineering, mathematics and medicine, to use best pedagogical practices for teaching K-12 STEM² lessons, and to successfully integrate the STEM² disciplines into lessons and units.

While the Graduate Certificate of STEM² Teaching is a ‘stand alone’ certificate that does not lead to a state endorsement, it creates an opportunity for graduate students to learn about STEM² for those who teach in schools, work in other areas of education such as museums, or provide outreach to K-12 students.
Transfer of Credit

A student may transfer in up to six (6) credit hours of graduate credit from the University of Michigan-Dearborn or another accredited institution provided the credits have not previously been applied to another degree or certificate. Credit hours transferred from other institutions must be taken within 5 years before enrollment with a grade of B or better.

Health Information Technology

The Master of Science in Health Information Technology (HIT) is designed for professionals in either health or information technology who are seeking masters level specialization in information systems dedicated to healthcare. The degree emphasizes data management, financial systems, and information security as well as treatment progress, patient management and outcome measurement.

The program prepares graduates for mid-level positions in hospital information technology departments, community health care clinics’ medical records departments, public health agencies, government health departments (federal, state and local), research departments for medical and health schools. The degree consists of 30 semester hours, available to both full and part-time students, and courses are scheduled during the late afternoon and evening sessions to accommodate the working professional. Summer course work is also available.

Admission Requirements & Application

Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor’s degree
- 3.0 (B) undergraduate/graduate grade point average or better
- Three letters of recommendation using required form
- Statement of purpose

Individuals who wish to apply for this program may initiate the application process online at: umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/)

Minimum Grade Point

A cumulative grade point average of 3.0 (B) is required for continuation in the program. Courses in which grades of D, E, or U are earned cannot be used to fulfill degree requirements. Students whose cumulative grade point average falls below a 3.00 (B) will be placed on probation. Continued deficiencies will result in a required withdrawal from the program.

For more information, call the Office of Student Success at 313-593-5090 or visit: umdearborn.edu/cehhs/cehhs_m_hit/ (http://umdearborn.edu/cehhs/cehhs_m_hit/)

Time Limits

All coursework toward the master’s degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.

Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIT 500</td>
<td>Economics of Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>HIT 510</td>
<td>Management of Healthcare Data</td>
<td>3</td>
</tr>
<tr>
<td>HIT 520</td>
<td>Clinical &amp; Evidence Based Med</td>
<td>3</td>
</tr>
<tr>
<td>ISM 525</td>
<td>Computer and Info Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISM 575</td>
<td>Information Management</td>
<td>3</td>
</tr>
<tr>
<td>ISM 641</td>
<td>Enterprise Architecture Netwrk</td>
<td>3</td>
</tr>
<tr>
<td>ISM 642</td>
<td>Information Assurance</td>
<td>3</td>
</tr>
<tr>
<td>ISM 650</td>
<td>Info System Quality</td>
<td>3</td>
</tr>
<tr>
<td>ISM 510</td>
<td>HIT</td>
<td>3</td>
</tr>
<tr>
<td>ISM 520</td>
<td>Core Coursework</td>
<td>3</td>
</tr>
<tr>
<td>ISM 568</td>
<td>Electives</td>
<td>6</td>
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<tr>
<td>ISM 569</td>
<td>Core Coursework</td>
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</tr>
<tr>
<td>ISM 643</td>
<td>ISM 510</td>
<td>3</td>
</tr>
<tr>
<td>ISM 644</td>
<td>ISM 510</td>
<td>3</td>
</tr>
<tr>
<td>ISM 645</td>
<td>ISM 510</td>
<td>3</td>
</tr>
<tr>
<td>ISM 646</td>
<td>ISM 510</td>
<td>3</td>
</tr>
<tr>
<td>ISM 647</td>
<td>ISM 510</td>
<td>3</td>
</tr>
<tr>
<td>ISM 648</td>
<td>ISM 510</td>
<td>3</td>
</tr>
<tr>
<td>ISM 649</td>
<td>ISM 510</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours: 30

Transfer Credit

Students may apply for transfer of credit of a maximum of 15 semester hours from applicable University of Michigan graduate courses. Students may apply to transfer six semester hours from another accredited graduate institution. Only graduate course credit hours earned during the last five years for which a grade of B or better was received will be considered for transfer. Transfer credit may be requested only after admission to the Master of Science in Health Information Technology program and successful completion of eight credit hours of graduate-level letter-graded coursework. All courses to be transferred must be approved by the Department Chair of Health and Human Services. A "Request for Transfer of Credit" form and official course descriptions and course syllabi must be submitted. Enrolled students must obtain prior approval of the Department Chair to elect classes off campus.

Online Teaching Certificate Program

This certificate program is designed to help individuals learn how to design, develop, and implement online instructional modules for a broad range of learners. The program consists of four classes for a total of 12 credits and would be suitable for anyone interested in becoming more proficient in the area of online teaching. Students will learn how to use
a wide-range of technologies to facilitate online learning and have the opportunity to implement many of the online modules they create in order to increase their confidence and competence in web-based instruction. Coursework also emphasizes research-based pedagogical practices and instructional design. This certificate is granted by the College of Education, Health, and Human Services and is not a university or state administered certification.

**Admission Requirements & Application**

Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor’s degree at an accredited institution
- 2.75 undergraduate/graduate grade point average or better

Individuals who wish to apply for this program may initiate the application process online at: [http://umdearborn.edu/cehhs/693111/](http://umdearborn.edu/cehhs/693111/).

**Transfer of Credit**

Transfer credit is not accepted for the Online Teaching Certificate Program.

**Time Limits**

All coursework toward the Online Teaching Certificate must be completed within 3 consecutive years from the date of first enrollment in the program. Students whose grade point average falls below a B (3.0 on a 4.0 scale) will be placed on probation.

Contact the Office of Student Success at 313-593-5090 for additional information or consult the College of Education, Health, and Human Services program web page at: [http://umdearborn.edu/cehhs/cehhs_cert_online_teaching/](http://umdearborn.edu/cehhs/cehhs_cert_online_teaching/)

**Program Requirements**

The Online Teaching Certificate program of study is 12 credit hours. A minimum cumulative GPA of B (3.0 on a 4.0 scale) must be maintained to continue enrollment in the program. The program requires successful completion of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDT 502</td>
<td>Survey of Educ Tech Tools</td>
<td>3</td>
</tr>
<tr>
<td>EDT 514</td>
<td>Application of Instrl Design</td>
<td>3</td>
</tr>
<tr>
<td>EDT 520</td>
<td>Intro to Teaching/Learn Online</td>
<td>3</td>
</tr>
<tr>
<td>EDT 522</td>
<td>Educating the Digital Learner</td>
<td>3</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

**Program Evaluation and Assessment**

The Master of Arts in Program Evaluation and Assessment is designed to prepare students for positions in assessment and evaluation particularly in educational settings or healthcare organizations. With an increasing emphasis on accountability, the demand for assessment and program evaluation is high in many fields. The curriculum will provide students with the knowledge and experience to:

1. Understand theories, issues, and approaches in assessment and program evaluation, 2: develop and administer formative and summative assessments and evaluation instruments, and 3: analyze and interpret assessment or evaluation results for evidence-based decision making. Students in this program will develop these skills and knowledge with a choice of a concentration in either education or health.

The UM-Dearborn MA in Program Evaluation and Assessment is differentiated from other Michigan institutions in that it uniquely combines assessment and program evaluation with a concentration in either education or health. The program will develop leaders who understand how issues of assessment and evaluation impact both schools and communities. Graduates will be equipped to handle the complexities of research design encountered in evaluations in institutional/organizational settings.

**Program Goals**

Graduates of the Master of Arts in Program Evaluation and Assessment program will become proficient in:

1. Designing and implementing formative and summative evaluations
2. Applying evaluation theory and diverse approaches in places of practice
3. Gathering, analyzing, interpreting, and using multiple data sources to make data-evidenced decisions
4. Understanding the types of requests from stakeholders in both formal and informal settings to know how to use a range of evaluation methods for assessing and furthering organizational goals

**Admission Requirements**

Students must submit the following items with their application. The GRE is not required for admission to this program. The Office of International Affairs lists additional admission requirements for international students (https://umdearborn.edu/io_international-grad-adm/).

- Bachelor’s degree from an accredited institution
- Official transcripts from all post-secondary institutions attended
- 3.0 GPA or higher on submitted transcripts
- Three professional letters of recommendation
- Personal statement

Students will be invited to participate in a group interview after their initial application materials have been reviewed.

**Transfer of Credit**

A limit of six (6) credit hours can be transferred from a non-University of Michigan school and 15 credit hours of University of Michigan credit that are applicable to the program of study and approved by the program coordinator. Only graduate course credit hours with a grade of B or better (3.0 on a 4.0 point scale) and earned in the five year period prior to acceptance into the program will be considered for transfer. Transfer credits may be requested only after admission to the Master of Science in Applied Behavior Analysis program and successful completion of eight (8) credit hours of letter-graded program coursework. A Request for Transfer of Credit form and official course descriptions and course syllabi must be submitted. Non-letter grades, e.g. pass-fail or satisfactory/unsatisfactory are not eligible for
transfer credit. Courses cannot be transferred for credit if: a) they were not graduate level courses; b) they were already applied in whole or in part toward a degree; c) they were taken more than five years before beginning the M.S. in Applied Behavior Analysis; or d) a grade below B (3.0 on a 4.0 scale) was earned. Enrolled students must obtain prior approval of the program coordinator to elect classes off campus.

Time Limits
All coursework toward the master's degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.

Program Requirements
The Master of Arts in Program Evaluation and Assessment is a 30 credit hour degree program. A minimum cumulative GPA of B (3.0 on a 4.0 scale) must be maintained to continue enrollment in the program. The program requires successful completion of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB 583</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>or HHS 506</td>
<td>Program Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>EDC 616</td>
<td>Needs Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDC 620</td>
<td>Survey Research and Design</td>
<td>3</td>
</tr>
<tr>
<td>EDC 623</td>
<td>Intro to Research in Education</td>
<td>3</td>
</tr>
<tr>
<td>EDC 623</td>
<td>Quantitative Research Methods</td>
<td>3-4</td>
</tr>
<tr>
<td>or HPS 510</td>
<td>Quantitative Research</td>
<td>3</td>
</tr>
<tr>
<td>EDC 625</td>
<td>Qualitative Research Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

SELECT ONE AREA OF FOCUS

Area of Focus: Education (select courses for 11-12 credit hours):
- EDC 505: Adult Learning: Theory & Practice 3
- EDC 545: Develop Assess of Young Child 3
- EDC 555: Assmt: Sec Lang Learning K-12 2
- EDC 556: Learning & Classrm Assessment 3
- EDC 560: Rdg/Diag/Assessment Tech K-12 3
- EDC 630: Portfolio and Performance 3
- EDC 645: Transdisc Appr. Assess/Collab 3
- EDN 503: Assessment of the Learner 3

OR

Area of Focus: Health (select courses for 12 credit hours)
- HIT 500: Economics of Healthcare 3
- HIT 510: Management of Healthcare Data 3
- HIT 520: Clinical & Evidence Based Med 3
- HPS 512: Principles of Epidemiology 3
- HPS 556: Health Care and the Law 3
- HPS 548: Comparative Health Care System 3
- STAT 530: Applied Regression Analysis 3

1 STAT 530 requires an undergraduate course in statistics

Science Education
The Master of Science in Science Education (MSSE) is designed for teachers at all levels who wish to further their knowledge of science as well as science pedagogy. The MSSE is based on the research underlying the Next Generation Science Standards.

The program is designed for professionals who possess either an elementary or secondary teaching certificate. MSSE students can elect to integrate studies of either literacy or the environment into their curriculum. To accommodate the different science content background of teachers with elementary or secondary certificates, this degree program has two tracks: one for K-8 teachers (Track I) and one for 6-12 teachers with BS or BA degrees in a science discipline (Track II). Depending on a student's background, a combination of the Tracks may be appropriate at the discretion of the Director of Graduate Programs. The degree consists of 30 semester hours, available to both full and part-time students although courses will be primarily offered during the late afternoon and evening sessions or in the summer to accommodate the working professional.

Admission Requirements & Application
Eligibility for regular admission includes:
- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor's degree from an accredited institution
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
- Statement of purpose
- State of Michigan Teaching Certificate

Individuals who wish to apply for this program may initiate the application process online at: umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/)

Transfer of Credit
Students may apply for transfer of credit of a maximum of 15 semester hours from applicable University of Michigan graduate courses. Students may apply to transfer six semester hours from another accredited graduate institution. Only graduate course credit hours earned during the last five years for which a grade of B or better was received will be considered for transfer. Transfer credit may be requested only after admission to the Master of Science in Science Education program and successful completion of eight credit hours of graduate-level letter-graded coursework. All courses to be transferred must be approved by the Director of Graduate Programs. A "Request for Transfer of Credit" form and official course descriptions and course syllabi must be submitted. Enrolled students must obtain prior approval of the Coordinator to elect classes off campus.

Time Limits
All coursework toward the master's degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.
Program Requirements

**Track I**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSCI 531</td>
<td>Adv Learning Inquiry: Phys Sci</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 532</td>
<td>Adv Inquiry: Earth/Planet Sci</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 533</td>
<td>Adv Inquiry: Life Science</td>
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**Pedagogy**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 575</td>
<td>Integrating Science &amp; Literacy</td>
<td>3</td>
</tr>
<tr>
<td>EDD 685</td>
<td>Adv Science Meth: Elem &amp; MS</td>
<td>3</td>
</tr>
<tr>
<td>EDT 510</td>
<td>Teaching with Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Assessment**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 556</td>
<td>Learning &amp; Classrm Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDK 500</td>
<td>Intro to Research in Education</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 520</td>
<td>Science Ed Action Research</td>
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</tr>
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</table>

**Electives**

Consult with the program advisor for eligible electives. 3

Total Credit Hours 30

**Track II**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td></td>
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**Pedagogy**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>EDD 574</td>
<td>Environmental Education</td>
<td>3</td>
</tr>
<tr>
<td>or EDD 586</td>
<td>Environmental Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>EDD 680</td>
<td>Adv Science Meth: Secondary</td>
<td>3</td>
</tr>
<tr>
<td>EDT 510</td>
<td>Teaching with Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Assessment**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC 556</td>
<td>Learning &amp; Classrm Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDK 500</td>
<td>Intro to Research in Education</td>
<td>3</td>
</tr>
<tr>
<td>EXPS 520</td>
<td>Science Ed Action Research</td>
<td>3</td>
</tr>
</tbody>
</table>

**Electives**

Consult with the program advisor for eligible electives. 3

Total Credit Hours 30

Special Education

The Master of Education in Special Education is a 30-credit hour program for teachers, administrators, and other service providers who wish to learn how to serve students with learning disabilities.

**Program Goals**

Graduates of the Master of Education in Special Education program will gain:

- Skills in developmental, educational, legal and evaluative aspects of all disability categories
- Skills in educational assessment, planning and teaching students with disabilities in general and special education environments
- Skills in consultation and collaboration with parents, educators and professionals throughout the community to provide appropriate and individualized services to students with learning disabilities

**Admission Requirements & Application**

Eligibility for regular admission includes:

- Bachelor’s degree from an accredited institution
- Official transcripts from all post-secondary institutions attended
- 3.0 GPA or higher on submitted transcripts
- Three professional letters of recommendation
- Personal statement
- Valid state of Michigan teaching certificate

Individuals who wish to apply for this program may initiate the application process online at: [umdearborn.edu/gradapplynow/](http://umdearborn.edu/gradapplynow/)

**Transfer of Credit**

For transfer courses, whether they are University of Michigan or non-University of Michigan, certain criteria must be met before the transfer application is made and in order for courses to transfer. There is a limit of six hours that can transfer from a non-University of Michigan school and 15 hours of University of Michigan credit as long as the courses apply to this program. Students are fully responsible for accurately planning their degree program. For additional information, please consult the Director of Master’s Degrees or the Office of Student Success 313-593-5090.

**Time Limits**

All coursework toward the master’s degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.

**Program Requirements**

**Master of Education in Special Education with a K-12 Learning Disabilities Endorsement (Michigan)**

Candidates for the K-12 Learning Disabilities Endorsement must have a bachelor’s degree from an accredited college or university and a Michigan teaching certificate. The Learning Disabilities endorsement requires a total of 30 credit hours of coursework. These courses are also applied toward the completion of the Master of Education in Special Education.
Teaching

The Master of Arts in Teaching program is designed for those who have completed a bachelor's degree in non-educational fields and wish to earn the Michigan Secondary Standard Teaching Certificate. Students in the MAT program will bring valuable experience and expertise to assist in their exploration of the practice of teaching. In addition to learning about adolescent learners and how to teach them, MAT coursework spurs students to think about the goals, values, beliefs and assumptions underlying formal schooling, and to consider schools in social, political and historical contexts.

The MAT coursework will be offered weekdays in the late afternoon and evening hours and online to enable students to earn the degree through part-time study. Students who are employed will be able to complete the degree through after-work study except for the Directed Teaching requirement. This will occur during the last semester of each student's residency.

Eligibility for regular admission includes:

- Completed application form
- $60.00 application fee
- Official transcript(s) from each college/university attended
- Completion of a bachelor's degree from an accredited institution
- 3.0 (B) undergraduate/graduate grade point average or better
- Three professional letters of recommendation using required form
- Statement of purpose
- Official record of meeting minimum scores on the Scholastic Aptitude Test (SAT) in Evidence-Based Reading and Writing (passing score 480) and in Mathematics (passing score 530). The SAT must have been passed on or after March 5, 2016.

Individuals who wish to apply for this program may initiate the application process online at: umdearborn.edu/gradapplynow/ (http://umdearborn.edu/gradapplynow/).

The teaching majors and optional minors currently available at CEHHS for the State of Michigan Secondary School certification are: Biology, Chemistry, Earth Science, Economics, English, English as Second Language (minor only), French, Geography (minor only), German (minor only), History, Integrated Science (major only), Mathematics, Physics, Political Science, Psychology (minor only), Social Studies (major only), Spanish and Speech.

Minimum Grade Point

A cumulative grade point average of 3.0 (B) is required for continuation in the program. Students whose cumulative grade point average falls below this level will be placed on probation. Continued deficiencies will result in a required withdrawal from the MAT Program.

Time Limits

All coursework toward the master's degree must be completed within five (5) consecutive years from the date of first enrollment in the Graduate School.
Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 500</td>
<td>Theoretical Foundations of Ed</td>
<td>3</td>
</tr>
<tr>
<td>EDB 500</td>
<td>Multicult Ed in US Classroom</td>
<td>3</td>
</tr>
<tr>
<td>EDC 502</td>
<td>Adol Dev &amp; Classroom Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>EDC 504</td>
<td>Pract Adol Dev&amp;Clsm Mgmt</td>
<td>1</td>
</tr>
<tr>
<td>EDC 556</td>
<td>Learning &amp; Clsm Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDC 561</td>
<td>Educating the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>EDD 569</td>
<td>Reading in the Content Areas</td>
<td>3</td>
</tr>
<tr>
<td>EDT 511</td>
<td>Design Tech-Based Learn Solutn</td>
<td>3</td>
</tr>
<tr>
<td>Methods Course in the Major Area</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Methods Course in the Minor Area</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>EDD 518</td>
<td>Directed Tchg (MAT) Second Sch</td>
<td>7-10</td>
</tr>
</tbody>
</table>

Total Credit Hours: 35-38

1Secondary Methods Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 501</td>
<td>Teach English in Second Grds</td>
<td>3</td>
</tr>
<tr>
<td>EDD 565</td>
<td>Teach Math in Second Grades</td>
<td>3</td>
</tr>
<tr>
<td>EDD 580</td>
<td>Teach of Sci in the Second Grd</td>
<td>3</td>
</tr>
<tr>
<td>EDD 590</td>
<td>Tch of the Soc Stud in Sec Sch</td>
<td>3</td>
</tr>
<tr>
<td>EDD 596</td>
<td>Second Lang Tchg: Sec Level</td>
<td>3</td>
</tr>
</tbody>
</table>

2Secondary Practicum Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD 502</td>
<td>Practicum: English Second Grd</td>
<td>1</td>
</tr>
<tr>
<td>EDD 548</td>
<td>Pract: Tchg as Second Lang</td>
<td>1</td>
</tr>
<tr>
<td>EDD 566</td>
<td>Practicum: Math Second School</td>
<td>1</td>
</tr>
<tr>
<td>EDD 581</td>
<td>Practicum in Science:Second Grd</td>
<td>1</td>
</tr>
<tr>
<td>EDD 589</td>
<td>Practicum in Soc Stud:Sec Sch</td>
<td>1</td>
</tr>
<tr>
<td>EDD 596</td>
<td>Second Lang Tchg: Sec Level</td>
<td>3</td>
</tr>
</tbody>
</table>

Prior to student teaching, students must have completed 90 hours experience working with groups of children. Students must complete at least one 45-hour graduate level practicum associated with the methods courses in their major or minor (see practica listed at 2 above). The remaining 45 hours of pre-student teaching experience may consist of volunteer opportunities sometimes available in the College of Education, Health, and Human Services and the University or may include similar self-arranged experiences; also, students may complete this obligation by completing a second 45-hour graduate level practicum (i.e., those associated with the methods courses in the major or minor or the Adolescent Development and Classroom Management Practicum (EDC 504).

Teaching English to Speakers of Other Languages Certificate Program

There are many opportunities for teaching English to speakers of other languages (TESOL). This UM-Dearborn certificate program is specifically designed for individuals seeking opportunities both locally or internationally and will prepare students with the requisite content knowledge and pedagogy to teach English to students or adults outside of the PK-12 public school system. Certificate holders may find careers with non-U.S. agencies/institutions in order to meet international needs to provide English instruction to their student populations.

This certificate does not lead to state teacher certification or a state endorsement. For those interested in PK-12 certification, please refer to the ESL Endorsement (http://umdearborn.edu/cehhs/tesol/).

The TESOL certificate program requires 15 graduate credit hours. All of the courses will prepare certificate students with the requisite content knowledge, pedagogy, and skills to teach non-native speakers of English.

Time Limits

The program is designed so that students can complete their certificates in one calendar year (three semesters). Students must complete the certificate program within three years from the date of first enrollment.

Admissions Requirements

All applicants must submit evidence of each of the following to the Office of Student Success along with a completed Post-Degree Application Form umdearborn.edu/cehhs/tesol/ (http://umdearborn.edu/cehhs/tesol/).

- Hold a baccalaureate degree from an accredited institution.
- A 2.75 or higher grade point average (GPA is based on a 4.0).
- An official transcript from college or university granting the undergraduate degree and one from each college or university attended.
- Submit a completed Post-Degree Application Form and non-refundable $30.00 application fee (payable by check or money order to University of Michigan-Dearborn). This fee is waived for applicants who have previously paid an application fee to any University of Michigan campus.

Transfer of Credit

A student may transfer in up to six (6) credit hours of graduate credit from the University of Michigan-Dearborn or another accredited institution provided the credits have not previously been applied to another degree or certificate. Credit hours transferred from other institutions must be taken within 5 years before enrollment with a grade of B or better.

Minimum Grade Point

A cumulative grade point average of 2.75 is required for continuation in the program. Courses in which grades of D, E, or U are earned cannot be used to fulfill requirements. Students whose cumulative grade point average falls below a 2.75 will be placed on probation. Continued deficiencies will result in a required withdrawal from the program.

For more information, call 313-593-5090 or visit: umdearborn.edu/cehhs/tesol/ (http://umdearborn.edu/cehhs/tesol/)

Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDA 555</td>
<td>Lang,Clture,Litrcty&amp;Power in Ed</td>
<td>3</td>
</tr>
</tbody>
</table>
opportunities for students and faculty. Our programs are designed to
and automotive suppliers have led to many educational and research
unique graduate education in the College of Engineering and Computer
outreach/online-learning/

and most master's degree programs may be completed fully online
master degrees, one part-time Doctor of Engineering and 4 Ph.D.
The College of Engineering and Computer Science (CECS) offers 17

and evening. Master's level study is offered in automotive systems
students are accommodated by course offerings late in the afternoon
of Classes

College of Engineering and Computer Science
Graduate Programs
While the undergraduate program in engineering offers a challenging
basic education, a program of graduate studies provides the opportunity
for advanced or special studies in particular areas of interest. Particularly
in an era of rapid technological and scientific advancement, many
students find continued study a decided advantage. It offers an attractive
opportunity to pursue their special interests and to acquire a more
thorough preparation for their professional careers.

The College of Engineering and Computer Science (CECS) offers 17
master degrees, one part-time Doctor of Engineering and 4 Ph.D.
programs. Our partnerships with major domestic automobile companies
and automotive suppliers have led to many educational and research
opportunities for students and faculty.

Many graduate programs and courses are offered using distance learning
technologies. Students interested in this flexible and convenient course
option should call 313-593-4000 or visit umdearborn.edu/cecs/extended-
learning-outreach.

Post-Baccalaureate Programs
The post-baccalaureate programs in engineering at the UM-Dearborn
are geared to the demands of the student and the desires of society to
further the technical background of the practicing engineer. Working
students are accommodated by course offerings late in the afternoon
and evening. Master's level study is offered in automotive systems
engineering, bioengineering, computer and information science, computer
engineering, cybersecurity and information assurance, electrical
engineering, energy systems engineering, engineering management, data
science, human-centered design and engineering,industrial and systems
engineering, information systems & technology, mechanical engineering,
manufacturing systems engineering, program and project management,
robotics engineering, and software engineering. Each of these programs
and their specific requirements are discussed in the sections that follow.

Master of Science in Engineering (MSE) and Master of Science (MS) Programs
The College of Engineering and Computer Science (CECS) offers 17
master degrees with many of our courses are offered in the evening
and most master’s degree programs may be completed fully online
through CECS Online (https://umdearborn.edu/cecs/extended-learning-
outreach/online-learning/). Students have the opportunity to receive a
unique graduate education in the College of Engineering and Computer
Science. Our partnerships with major domestic automobile companies
and automotive suppliers have led to many educational and research
opportunities for students and faculty. Our programs are designed to
provide a thorough and vigorous educational experience both for the
student who plans to enter the engineering profession after completing
the requirements and for the student who wishes to pursue the PhD. This
is accomplished by the curricula, which provides appropriate breadth,
while at the same time permitting the students considerable freedom
in the selection of both engineering science and professionally oriented
courses in their special interests, and through an environment in which
faculty and graduate students may work together on a broad spectrum of
research projects.

Students planning part-time study can begin their work during any of
the three terms. Class schedules are arranged to accommodate part-
time, later afternoon, and evening students from local industrial firms.
Information on this kind of program, which provides many advantages to
both employer and student, can be obtained from the graduate program
advisor.

Ph.D. Programs
The College of Engineering and Computer Science (CECS) offers 5
doctoral programs: 4 full-time Ph.D. programs and one part-time Doctor
of Engineering (D. Eng.) program. In CECS, we are committed to excellence.
Our doctoral programs are administered and taught by tenure-track
faculty with active theoretical and translational research interests.
Students and faculty work collaboratively and develop strong mentor
relationships.

Located in the automotive industry’s global epicenter in Metro Detroit, the
university has developed strategic partnerships with major automobile
companies and suppliers. Faculty and students have a variety of
opportunities and regularly collaborate on innovative research with
industry partners.

Course Descriptions
The following lists include all courses normally offered at UM-Dearborn.
However, not all courses are offered every year and periodically courses
are added and deleted. For details, students should consult the Schedule
of Classes for each term.

Master's Programs

- Automotive Systems Engineering (p. 950)
- Bioengineering (p. 951)
- Computer and Information Science (p. 954)
- Computer Engineering (p. 965)
- Cybersecurity & Information Assurance (p. 977)
- Data Science (p. 979)
- Electrical Engineering (p. 981)
- Energy Systems Engineering (p. 996)
- Engineering Management (p. 997)
- Human-Centered Design and Engineering (p. 998)
- Industrial and Systems Engineering (p. 999)
- Information Systems and Technology (p. 1011)
- Manufacturing Systems Engineering (p. 1014)
- Mechanical Engineering (p. 1021)
- Program and Project Management (p. 1032)
- Robotics Engineering (p. 1033)
- Software Engineering (p. 1034)
Doctorate Programs

- D.Eng. in Automotive Systems and Mobility (p. 947)
- Ph.D. in Computer and Information Science (p. 956)
- Ph.D. in Electrical, Electronics, and Computer Engineering (p. 993)
- Ph.D. Industrial and Systems Engineering (p. 1001)
- Ph.D. in Mechanical Sciences and Engineering (p. 1030)

Dual Degree Programs

- Industrial and Systems Engineering (MSE) and Master of Business Administration (MBA) (p. 1001)

Certificates

- Automotive Materials and Design (p. 946)
- Automotive Noise, Vibration & Harshness (p. 946)
- Automotive Powertrains (p. 946)
- Control Systems (p. 977)
- Electric Energy Technology (p. 981)
- Game Design (p. 998)
- Intelligent Systems in Engineering Applications (p. 1013)
- Plastic & Composite Materials (p. 1032)
- Program & Project Management (p. 1033)
- Software Engineering (p. 1036)
- Systems Engineering (p. 1036)
- Vehicle Electronics & Controls (p. 1037)

Administration

Tony England, PhD, Dean
Ghassan Kridli, PhD, Associate Dean for Undergraduate Education
Yi Lu Murphey, PhD, Associate Dean for Graduate Education and Research
John Cristiano, PhD, Director, Henry W. Patton Center for Engineering Education and Practice, and Institute for Advanced Vehicle Systems
Anthony DeLaRosa, MA, Assistant Director, Experiential Learning and Co-op Education
M. Jeanne Girard, MPA, Director, Office of Extended Learning and Outreach
Eric Kirk, Director, Lab Safety
Leigh McGrath, BS, Director, Business Operations
Lisa Remsing Hall, PhD, Director, Advising and Academic Success

Chairs and Directors

Oleg Zikanov, Chair, Department of Mechanical Engineering
Paul Richardson, Chair, Department of Electrical and Computer Engineering
Armen Zakarian, Chair, Department of Industrial and Manufacturing Systems Engineering
Qiang Zhu, Chair, Department of Computer and Information Science

Professors Emeriti

Aswad, A. Adnan, PhD, Professor Emeritus of Industrial and Manufacturing Systems Engineering
Boffi, Luiz V., ScD, Professor Emeritus of Electrical and Computer Engineering
Bolling, Fredric, PhD, Professor Emeritus of Mechanical Engineering
Cairns, J. Robert, PhD, Professor Emeritus of Mechanical Engineering
Chang, Chia-hao, PhD, Professor Emeritus of Industrial and Manufacturing Systems Engineering
Conlon, Howard E., MS, Associate Professor Emeritus of Mechanical Engineering
Despres, Thomas A., PhD, Professor Emeritus of Mechanical Engineering
Habib, Izzeddin S., PhD, Professor Emeritus of Mechanical Engineering
Heim, Dwight S., PhD, Professor Emeritus of Electrical Engineering
Kachhal, Swatanka K., PhD, Professor Emeritus of Industrial and Manufacturing Systems Engineering
Kampfner, Roberto, PhD, Associate Professor Emeritus of Computer and Information Science
Knight, James W., PhD, Associate Professor Emeritus of Industrial and Manufacturing Systems Engineering
Murtuza, Syed, PhD, Professor Emeritus of Electrical and Computer Engineering
Riordan, John, MS, Professor Emeritus of Computer and Information Science
Sullivan, Joseph E., MS, Associate Professor Emeritus of Electrical and Computer Engineering
Tsui, Louis, PhD, Associate Professor Emeritus of Computer and Information Science
Wolf, Louis W., PhD, Associate Professor Emeritus of Mechanical Engineering

Faculty

Department of Computer and Information Science

Abouelenien, Mohamed, PhD, University of North Texas, Assistant Professor of Computer and Information Science
Akingbehin, Kumi, PhD, Wayne State University, Professor of Computer and Information Science
Bacha, Anys, PhD, Ohio State University, Assistant Professor of Computer and Information Science
Dehzangi, Omid, PhD, Nanyang Technological University, Assistant Professor of Computer and Information Science
Elenbogen, Bruce, PhD, Northwestern University, Associate Professor of Computer and Information Science
Grosky, William I., PhD, Yale University, Professor of Computer and Information Science
Guo, Jinhua, PhD, University of Georgia, Assistant Professor of Computer and Information Science
Kessentini, Marouan, PhD, University of Montreal, Assistant Professor of Computer and Information Science
Ma, Di, PhD, University of California-Irvine, Assistant Professor of Computer and Information Science
Maxim, Bruce, PhD, University of Michigan, Professor of Computer and Information Science
Medjahed, Brahim, PhD, Virginia Tech University, Assistant Professor of Computer and Information Science
Neji, Sana, MBA/IMS, University of Quebec, Lecturer III of Computer and Information Science
Ortiz, Luis, PhD, Brown University, Assistant Professor of Computer and Information Science
Shen, Jie, PhD, University of Saskatchewan, Assistant Professor of Computer and Information Science
Wang, Shengquan, PhD, Texas A&M University, Assistant Professor of Computer and Information Science
Xu, Zhiwei, PhD, Florida Atlantic University, Assistant Professor of Computer and Information Science
Yoon, David, PhD, Wayne State University, Associate Professor of Computer and Information Science
Zhu, Qiang, PhD, University of Waterloo, Professor of Computer and Information Science

Department of Electrical and Computer Engineering

Awad, Selim Saad, PhD, Polytechnic Institute of Grenoble, Professor of Electrical and Computer Engineering
Baek, Stanley, PhD, University of California-Berkeley, Assistant Professor of Electrical and Computer Engineering
Bai, Hua, PhD, Tsinghua University, Associate Professor of Electrical and Computer Engineering
El Kateeb, Ali, PhD, Concordia University, Associate Professor of Electrical and Computer Engineering
Islam, Riadul, PhD, University of California-Santa Cruz, Assistant Professor of Electrical and Computer Engineering
Kim, Taeyhong, PhD, Texas A&M, Associate Professor of Electrical and Computer Engineering
Lakshmanan, Sridhar, PhD, University of Massachusetts Amherst, Associate Professor of Electrical and Computer Engineering
Liu, Chun-Hung, PhD, University of Texas-Austin, Assistant Professor of Electrical and Computer Engineering
Malik, Hafiz, PhD, University of Illinois at Chicago, Associate Professor of Electrical and Computer Engineering
Miller, John, PhD, University of Toledo, Associate Professor of Electrical and Computer Engineering
Murphey, Yi Lu, PhD, University of Michigan, Professor of Electrical and Computer Engineering
Putty, Michael, PhD, University of Michigan, Lecturer III of Electrical and Computer Engineering
Rawashdeh, Samir, PhD, University of Kentucky, Assistant Professor of Electrical and Computer Engineering
Richardson, Paul C., PhD, Oakland University, Professor of Electrical and Computer Engineering
Shaour, Adnan, PhD, Syracuse University, Professor of Electrical and Computer Engineering
Shridhar, Malayappan, PhD, University of Aston, Professor of Electrical and Computer Engineering
Su, Wencong, PhD, North Carolina State University, Assistant Professor of Electrical and Computer Engineering
Wang, Mengqi, PhD, North Carolina State University, Assistant Professor of Electrical and Computer Engineering
Watta, Paul, PhD, Wayne State University, Associate Professor of Electrical and Computer Engineering
Wei, Lu, PhD, Aalto University, Assistant Professor of Electrical and Computer Engineering
Xiang, Weidong, PhD, Tsinghua University, Professor of Electrical and Computer Engineering
Yi, Yasha, PhD, Massachusetts Institute of Technology, Associate Professor of Electrical and Computer Engineering
Zhao, Dongming, PhD, Rutgers University, Professor of Electrical and Computer Engineering
Zheng, Yu, PhD, University of North Carolina, Assistant Professor of Electrical and Computer Engineering

Department of Industrial Manufacturing Systems Engineering

Ayoub, Georges Y., PhD, University of Lille, Assistant Professor of Industrial and Manufacturing Systems Engineering
Chehade, Abdallah, PhD, University of Wisconsin-Madison, Assistant Professor of Industrial and Manufacturing Systems Engineering
Chen, Xi, PhD, University of Minnesota, Assistant Professor of Industrial and Manufacturing Systems Engineering
Chen, Yubao, PhD, University of Wisconsin-Madison, Professor of Industrial and Manufacturing Systems Engineering
Hu, Jian, PhD, Northwestern University, Assistant Professor of Industrial and Manufacturing Systems Engineering
Hu, Zhen, PhD, Missouri University of Science and Technology, Assistant Professor of Industrial and Manufacturing Systems Engineering
Extended Learning & Outreach (ELO)

Extended Learning & Outreach provides programs and technical seminars designed for engineering and computer science professionals interested in continuing education opportunities.

Many offerings can be customized to accommodate both individual and organizational requirements. Programs are available in face-to-face or online formats. ELO’s various programming areas currently include:

CECS Online

Most CECS graduate courses are available online, making it possible to complete an entire degree or certificate program online. Most courses do require examination proctoring, either at the UM-Dearborn campus or utilizing a proctor at an alternate location. Presently, all CECS Online (https://umdearborn.edu/cecs/extended-learning-outreach/online-learning/) courses are offered asynchronously, providing students with the flexibility to learn anytime, anywhere. Each online course has a companion campus-based course and both are taught by the same instructor. Campus-based courses are recorded and posted to course websites so that students can view recorded lectures at their convenience. Online students have opportunities to interact with
Automotive Materials and Design

The automotive system of the twenty-first century is poised to advance at a rapid pace with greater emphasis on lightweight structures, high efficiency powertrains, intelligent control systems, lower emissions, robust design and manufacturing, as well as improved comfort and safety. This certificate program gives an opportunity for automotive engineers to learn about lightweight materials, advancements in ergonomic and structural design, vehicle dynamics and control, and advanced manufacturing techniques (12 credit hours).

Certificate offered on Campus and via Distance Learning.

Coursework Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>AENG 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 550</td>
<td>Design of Automotive Chassis</td>
<td>3</td>
</tr>
<tr>
<td>AENG 551</td>
<td>FEM in Auto Structure Design</td>
<td>3</td>
</tr>
<tr>
<td>AENG 555</td>
<td>Vehicle Stability &amp; Control</td>
<td>3</td>
</tr>
<tr>
<td>AENG 586</td>
<td>Design &amp; Mfg: Ltwt Auto Mat</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 593</td>
<td>Vehicle Package Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ME 543</td>
<td>Vehicle Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 545</td>
<td>Acoustics and Noise Control</td>
<td>3</td>
</tr>
<tr>
<td>ME 584</td>
<td>Mechanical Behavior of Polymer</td>
<td>3</td>
</tr>
<tr>
<td>ME 587</td>
<td>Automotive Composites</td>
<td>3</td>
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</tbody>
</table>

Automotive Powertrains

Automobiles of the twenty-first century is poised to advance at a rapid pace with greater emphasis on lightweight structures, high efficiency powertrains, intelligent control systems, lower emissions, robust design and manufacturing, as well as improved comfort and safety. This certificate program gives an opportunity for automotive engineers interested in high efficiency powertrains to learn about the advancements in engines, transmissions, electric and hybrid vehicles, and emission controls. (12 credit hours)

Certificate offered on Campus and via Distance Learning.

Coursework Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ECE 530</td>
<td>Energy Storage Systems</td>
<td>3</td>
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<tr>
<td>ECE 532</td>
<td>Auto Sensors and Actuators</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5462</td>
<td>Elec Aspects of Hybrid Vehicle</td>
<td>3</td>
</tr>
<tr>
<td>ME 538</td>
<td>Vehicle Thermal Management</td>
<td>3</td>
</tr>
<tr>
<td>ME 547</td>
<td>Powertrains I</td>
<td>3</td>
</tr>
<tr>
<td>ME 548</td>
<td>Automotive Powertrains II</td>
<td>3</td>
</tr>
<tr>
<td>ME 570</td>
<td>Powertrain NVH of Elect Veh</td>
<td>3</td>
</tr>
<tr>
<td>ME 596</td>
<td>Internal Combustion Engines I</td>
<td>3</td>
</tr>
<tr>
<td>ME 597</td>
<td>Internal Combustion Engines II</td>
<td>3</td>
</tr>
<tr>
<td>ME 598</td>
<td>Engine Emissions</td>
<td>3</td>
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</tbody>
</table>

Automotive Systems and Mobility

The Doctor of Engineering (D.Eng.) in Automotive Systems and Mobility (ASM), centers on engineering practice and application, problem-solving skills, and innovation to prepare graduates for technical leadership roles in the automotive and mobility industry.

The D.Eng. encourages doctoral students to conduct cutting edge research using emerging technologies in the broad areas of automotive engineering and mobility. It is a multidisciplinary program with core research areas in Automotive Cybersecurity; Advanced Simulation; Human Factors & Transportation Systems Safety; Connected and Autonomous Vehicles; Dynamics, Control & Vehicle Safety; Electrified Vehicles; Materials,
Manufacturing, & Design; Shared Mobility; Thermal-Fluid & Combustion; and Data Analytics in Automotive & Mobility.

Program Details
The D.Eng. degree requirements require a minimum of 36 credits hours including 6 credit hours of coursework, 6 credit hours of directed study and pre-candidate research courses, and 24 credit hours of dissertation research.

Program Policies
In addition to the UM-Dearborn Graduate School policies for doctoral students, as a doctoral student in ASM program, you need to know the requirements, timeline, and processes for Pre-candidacy, Candidacy, Proposal Exam, and eventually your Dissertation Defense.

Also, an Annual Progress Report completed by you and your faculty advisor must be submitted for review to the ASM Doctoral Committee in May of each year.

The ASM Doctoral Committee and your Faculty Advisor are the main resources for information and guidance throughout your program.

Curriculum Requirements
A student must complete a minimum of 36 credit hours including:

- 6 credit hours of coursework
- 6 credit hours of directed study and pre-candidate research courses
- 24 credit hours of dissertation research.

Pre-Candidacy Coursework Requirement
The program requires completion of:

- Two curricular qualifying courses with a combined GPA of 3.5/4.0 and 3.3/4.0 or better in each course
  - The two graduate courses must be related to the student’s chosen core research area and recommended by the advisor.
- ASM 791 Doctoral Directed Study
- ASM 980 Pre-Candidate Dissertation Research

Core Research Areas and Approved Courses
Automotive Cybersecurity

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CIS 540</td>
<td>Foundation of Info. Sec.</td>
<td>3</td>
</tr>
<tr>
<td>CIS 544</td>
<td>Computer and Network Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 545</td>
<td>Data Security and Privacy</td>
<td>3</td>
</tr>
<tr>
<td>CIS 546</td>
<td>Security&amp;Privacy Wireless Ntwk</td>
<td>3</td>
</tr>
<tr>
<td>CIS 548</td>
<td>Sec and Priv in Cloud Comp</td>
<td>3</td>
</tr>
<tr>
<td>CIS 549</td>
<td>Software Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 584</td>
<td>Adv Comp Net Sec</td>
<td>3</td>
</tr>
<tr>
<td>CIS 624</td>
<td>Res Adv Cmp Net Sec</td>
<td>3</td>
</tr>
<tr>
<td>ECE 527</td>
<td>Multimedia Secur &amp; Forensics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 528</td>
<td>Cloud Computing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Embedded Systems</td>
<td>3</td>
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Advanced Simulation, Human Factors and Transportation Systems Safety

<table>
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<tr>
<td>CIS 552</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 652</td>
<td>Info Visualztn &amp; Comp Anim</td>
<td>3</td>
</tr>
<tr>
<td>HCDE 510</td>
<td>Foundation of HCDE</td>
<td>3</td>
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<tr>
<td>HCDE 520</td>
<td>Research Methods in HCDE</td>
<td>3</td>
</tr>
<tr>
<td>HCDE 530</td>
<td>Information Visualization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 501</td>
<td>Human Factors &amp; Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 514</td>
<td>Multivariate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 546</td>
<td>Safety Engineering</td>
<td>3</td>
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<tr>
<td>IMSE 569</td>
<td>Sys Simulation in Auto Eng</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 577</td>
<td>Human-Computer Interaction</td>
<td>3</td>
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<tr>
<td>IMSE 593</td>
<td>Vehicle Package Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 659</td>
<td>Advanced System Simulation</td>
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Connected and Autonomous Vehicles

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<tr>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>CIS 527</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CIS 535</td>
<td>Wireless Tech/Pervasive Cmptg</td>
<td>3</td>
</tr>
<tr>
<td>CIS 537</td>
<td>Advanced Netwrkg &amp; Dist Syst</td>
<td>3</td>
</tr>
<tr>
<td>CIS 579</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CIS 585</td>
<td>Adv Al</td>
<td>3</td>
</tr>
<tr>
<td>CIS 647</td>
<td>Rsrch Advances Ntwkg&amp;Dist Sys</td>
<td>3</td>
</tr>
<tr>
<td>CIS 685</td>
<td>Res Adv in Art Intell</td>
<td>3</td>
</tr>
<tr>
<td>ECE 527</td>
<td>Multimedia Secur &amp; Forensics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 531</td>
<td>Intelligent Vehicle Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 536</td>
<td>All Weather Automotive Vision</td>
<td>3</td>
</tr>
<tr>
<td>ECE 543</td>
<td>Kinem, Dynam Control Robots</td>
<td>3</td>
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<tr>
<td>ECE 544</td>
<td>Mobile Robots</td>
<td>3</td>
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<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td>3</td>
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<tr>
<td>ECE 5702</td>
<td>High-Speed and Adv Networks</td>
<td>3</td>
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<tr>
<td>ECE 577</td>
<td>Engineering in Virtual World</td>
<td>3</td>
</tr>
<tr>
<td>ECE 586</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 612</td>
<td>Wireless Sensor Networks</td>
<td>3</td>
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<tr>
<td>ECE 642</td>
<td>Robotic Embed Sys</td>
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<td>ECE 644</td>
<td>Advanced Robotics</td>
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<tr>
<td>ECE 645</td>
<td>Coop Robots</td>
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<tr>
<td>ECE 650</td>
<td>Info Theory in Elec Comm</td>
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<tr>
<td>ECE 661</td>
<td>Sys Ident and Adaptive Control</td>
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</tr>
<tr>
<td>ECE 679</td>
<td>Adv Intelligent Sys</td>
<td>3</td>
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Dynamics, Control and Vehicle Safety

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>AENG 502</td>
<td>Modeling of Automotive Systems</td>
<td>3</td>
</tr>
<tr>
<td>AENG 547</td>
<td>Automotive Powertrains I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 555</td>
<td>Vehicle Stability &amp; Control</td>
<td>3</td>
</tr>
<tr>
<td>ECE 515</td>
<td>Vehicle Electronics II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 532</td>
<td>Auto Sensors and Actuators</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
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<tr>
<td>Code</td>
<td>Title</td>
<td>Credit Hours</td>
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<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
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<tr>
<td>ECE 565</td>
<td>Digital Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 567</td>
<td>Nonlinear Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ME 540</td>
<td>Mechanical Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>ME 542</td>
<td>Advanced Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 543</td>
<td>Vehicle Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 548</td>
<td>Automotive Powertrains II</td>
<td>3</td>
</tr>
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</table>

Electrified Vehicles

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>AENG 598</td>
<td>Energy Sys for Auto Vehicles</td>
<td>3</td>
</tr>
<tr>
<td>ECE 515</td>
<td>Vehicle Electronics II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 517</td>
<td>Adv Pwr Electrncs&amp;Motor Drvs</td>
<td>3</td>
</tr>
<tr>
<td>ECE 519</td>
<td>Adv Topics in EMC</td>
<td>3</td>
</tr>
<tr>
<td>ECE 532</td>
<td>Auto Sensors and Actuators</td>
<td>3</td>
</tr>
<tr>
<td>ECE 542</td>
<td>Elec Aspects of Hybrid Vehicle</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5791</td>
<td>Vehicle Power Management</td>
<td>3</td>
</tr>
<tr>
<td>ECE 646</td>
<td>Adv Elec Drive Transportation</td>
<td>3</td>
</tr>
<tr>
<td>ESE 502</td>
<td>Energy Storage Systems</td>
<td>3</td>
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Materials, Manufacturing, and Design

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>AENG 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 550</td>
<td>Design of Automotive Chassis</td>
<td>3</td>
</tr>
<tr>
<td>AENG 586</td>
<td>Design &amp; Mfg: Ltwt Auto Mat</td>
<td>3</td>
</tr>
<tr>
<td>AENG 589</td>
<td>Auto Assembly Systems</td>
<td>3</td>
</tr>
<tr>
<td>AENG 650</td>
<td>Analys&amp;Des for Veh Crashwrthns</td>
<td>3</td>
</tr>
<tr>
<td>ECE 539</td>
<td>Production of Elec Prods</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 502</td>
<td>Computer-Integrated Mfg</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 504</td>
<td>Metal Forming Processes</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 519</td>
<td>Quan Meth in Quality Eng</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 538</td>
<td>Intelligent Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt and Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 580</td>
<td>Prod &amp; Oper Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 581</td>
<td>Prod &amp; Oper Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 593</td>
<td>Vehicle Package Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ME 514</td>
<td>Advanced Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 558</td>
<td>Fracture and Fatig Cons in Des</td>
<td>3</td>
</tr>
<tr>
<td>ME 582</td>
<td>Injection Molding</td>
<td>3</td>
</tr>
<tr>
<td>ME 583</td>
<td>Mechanical Behav of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 584</td>
<td>Mechanical Behavior of Polymer</td>
<td>3</td>
</tr>
<tr>
<td>ME 587</td>
<td>Automotive Composites</td>
<td>3</td>
</tr>
<tr>
<td>ME 589</td>
<td>Composite Materials</td>
<td>3</td>
</tr>
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</table>

Shared Mobility

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 500</td>
<td>Models of Oper Research</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 505</td>
<td>Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 514</td>
<td>Multivariate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 559</td>
<td>System Simulation</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 584</td>
<td>Logistical Systems</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 605</td>
<td>Advanced Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 606</td>
<td>Advanced Stochastic Processes</td>
<td>3</td>
</tr>
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</table>

Thermal-Fluid Combustion

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 522</td>
<td>Advanced Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 525</td>
<td>Computational Thermo-Fluids</td>
<td>3</td>
</tr>
<tr>
<td>ME 528</td>
<td>Fund of Boiling and Condensatn</td>
<td>3</td>
</tr>
<tr>
<td>ME 532</td>
<td>Combustion Processes</td>
<td>3</td>
</tr>
<tr>
<td>ME 535</td>
<td>Advanced Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 537</td>
<td>Automotive Air Conditioning</td>
<td>3</td>
</tr>
<tr>
<td>ME 538</td>
<td>Vehicle Thermal Management</td>
<td>3</td>
</tr>
<tr>
<td>ME 545</td>
<td>Acoustics and Noise Control</td>
<td>3</td>
</tr>
<tr>
<td>ME 571</td>
<td>Conduction Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ME 572</td>
<td>Convection Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ME 596</td>
<td>Internal Combustion Engines I</td>
<td>3</td>
</tr>
<tr>
<td>ME 597</td>
<td>Internal Combustion Engines II</td>
<td>3</td>
</tr>
<tr>
<td>ME 598</td>
<td>Engine Emissions</td>
<td>3</td>
</tr>
<tr>
<td>ME 622</td>
<td>Adv Topics in Fluid Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Data Analytics in Automotive Mobility

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 511</td>
<td>Natural Language Processing</td>
<td>3</td>
</tr>
<tr>
<td>CIS 536</td>
<td>Information Retrieval</td>
<td>3</td>
</tr>
<tr>
<td>CIS 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 5570</td>
<td>Introduction to Big Data</td>
<td>3</td>
</tr>
<tr>
<td>CIS 568</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>CIS 5700</td>
<td>Advanced Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>CIS 571</td>
<td>Web Services</td>
<td>3</td>
</tr>
<tr>
<td>CIS 580</td>
<td>Data Analytics in Software Eng</td>
<td>3</td>
</tr>
<tr>
<td>CIS 586</td>
<td>Advanced Data Management</td>
<td>3</td>
</tr>
<tr>
<td>ECE 537</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>ECE 576</td>
<td>Information Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 586</td>
<td>Big Data Anal &amp; Visuliztn</td>
<td>3</td>
</tr>
<tr>
<td>ECE 579</td>
<td>Intelligent Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

**Early Start Requirements**

The students are expected to engage in research work from the first year of the program. To facilitate that, each student should have a faculty research advisor at the beginning of the first semester and develop the dissertation research topic with the faculty advisor by the end of the second semester in the program. There is an additional requirement that at least 6 credit hours of faculty-guided research (ASM 791 or ASM 980)
Research Maintenance Requirements

- ASM 990 (Dissertation for candidates) can be taken only after a student achieves candidacy. A minimum of 24 credit hours in ASM 990 is required.
- During the candidacy, a student enrolls in ASM 990 every semester. The outcomes of ASM 990 include a written dissertation research progress report, a presentation of research results to the dissertation committee. A “S” or “U” grade will be given by the adviser based on the student’s performances in research. Any “U” grade will be reviewed by the committee and a written plan will be provided to the student about what is needed to improve dissertation research. The metric to measure a student’s progress includes, but not limited to, regular meetings with the adviser, good quality research progress reports, publications, patent applications, prototype system demos, and well-recognized open-source programs. The faculty advisor notifies the committee about the student’s progress in each semester.
- A Student must register to ASM 791, ASM 980 or ASM 990 must arrange meetings with the faculty advisors at least twice per month for mentoring by the advisor.

Dissertation Committee

The dissertation committee is formed when a student takes ASM 980. As a rule, the dissertation committee continues overseeing the student’s work to the stage of the final dissertation defense.

- The faculty advisor serves as the chair of the Dissertation Committee.
- The dissertation committee will consist of a minimum of three members in addition to the chair. The committee members will include two faculty members (at least one member from the CECS) and one industry member.
- The composition of the dissertation committee must be approved by the D. Eng. program committee. The industry member’s curriculum vitae must be submitted to the Program Committee for approval.
- Depending on the dissertation topic, a faculty member outside the CECS may be included in the dissertation committee.
- A committee may have a sole chair or two co-chairs. Persons who may serve as co-chair, but not the sole chair, include:
  - tenure or tenure-track members of the University’s instructional faculty;
  - research faculty;
  - instructors and lecturers;
  - similarly qualified University faculty or staff, or person from outside the University; and
  - former University faculty members who have moved to a faculty position at another university

Candidacy Requirements

Achieving candidacy for the D. Eng. in ASM requires:

- Completion of two curricular qualification courses and maintain a combined GPA of 3.5/4.0 and 3.3/4.0 or better for each course
- Completion of all the required outcomes of ASM 980
- Submission of the candidacy application form
- Approved Doctoral Dissertation Committee

Dissertation

After passing ASM 980, the student may proceed with the dissertation research and the writing of the dissertation. The dissertation should document the original contributions made by the candidate as a result of independent research. This research work should be of archival quality. In advance of graduation, all members of the student’s dissertation committee must approve the dissertation. To obtain this approval a student must submit a written copy of the dissertation to the dissertation committee and defend the research work at a final oral examination open to other faculty, students, and the interested public. Students defending the dissertation must be registered in ASM 990.

Upon completion of the dissertation work, the student initiates the last step toward the degree—the dissertation defense process. The process follows the official guidelines and consists of the following main stages:

- Preparation of a written dissertation formatted in accordance with the guidelines,
- Pre-Defense meetings with the members of the program committee,
- Written evaluations of the dissertation by the dissertation committee members
- The Oral Defense of the dissertation consisting of two parts:
  - Public seminar and open question session held by the student
  - Private deliberations by the committee,
- Final oral examination report and certificate of approval prepared by the dissertation committee
- Post-Defense meeting with the CECS Graduate Education Office

Timeline Requirements

The D. Eng. ASM program has a time limit of 3 years for completion. Students are expected to complete the degree within 2 years after achieving candidacy, but no more than 3 years from the date of the first enrollment in the program.

All D. Eng. ASM students are required to register for either the program’s coursework or dissertation credits every fall and winter semester unless they are on an approved leave of absence. Students may request a leave of absence when certain life events prevent continued active participation in their degree program. Students may request a leave of absence as early as six months prior to the term the leave is to start. A leave will be granted to students for illness (either physical or mental) or injury, to enable them to provide care or assistance for family or dependents, to allow them to meet military service obligations, or for other personal reasons. The student’s request for a leave of absence will need the approval by the CECS Doctoral Program Committee.

A student is considered to have completed the D. Eng. ASM program only if the student has completed the two required courses with satisfactory grades and the required research credit hours, passed the dissertation defense and got a satisfactory grade on the written dissertation. A petition for an extension of study time may be submitted by the student with the endorsement of student’s dissertation advisor to the committee of D. Eng. in ASM for approval. The time extension will be no more than 2 years. Table 2.2 is an example of curriculum.
Automotive Systems Engineering

The automotive industry of the twenty-first century is advancing at a rapid pace with great emphasis on lightweight structures, alternative energy sources, high efficiency powertrains, intelligent control systems, lower emissions, robust design and manufacturing, as well as improved comfort and safety. To meet the challenges of the automotive industry, engineers are required to improve their technical knowledge and skills in a variety of topics that are beyond the realm of traditional engineering curricula.

Today’s automotive engineers are expected to make connections among different areas of knowledge and integrate them in ways that benefit the automotive industry, society and the environment. Automotive engineers must be well grounded in their own areas of specialty. They must also have a good understanding of the related disciplines, be skilled in synthesis, analysis and design, work effectively in a team environment, and adopt a ‘systems’ approach.

In response to these needs, the College of Engineering and Computer Science offers a 30-credit-hour interdisciplinary graduate degree program leading to a master’s degree in Automotive Systems Engineering. Many courses in this program are specifically designed to address the new and emerging technology in the automotive industry. Students in this program will not only learn about advanced technologies, but also how to apply them in practice for creative design and problem solving.

The Automotive Systems Engineering degree program aims to achieve the following educational goals:

1. Provide depth in the area of automotive systems engineering.
2. Provide breadth across the engineering disciplines of electrical, industrial, mechanical, materials, and manufacturing engineering and provide this breadth from an engineering systems perspective.

A candidate for the Master of Science in Engineering in Automotive Systems Engineering must meet the requirements for the Bachelor of Science degree at this campus or the equivalent of these requirements. Undergraduate degrees must be from an accredited program, and for regular admission must be with an average of B or better. Each applicant should present complete, official transcripts of all prior college work.

The candidate must then complete at least 30 semester hours of graduate work approved by the program advisor/graduate advisory committee with a grade of at least a B covering all courses elected. No more than one B- will be allowed under any circumstances. Applicants who meet the general admission criteria but do not have adequate preparation in required areas of engineering would be asked to take appropriate undergraduate courses as a condition for full admission to the program. Such courses, when elected, will not count towards the degree requirements.

The automotive systems engineering degree program is made up of three components:

1. Core courses of 12 credit hours.
2. Concentration courses of 18 credit hours.

Core Courses

The core is intended to provide a unified graduate-level preparation in interdisciplinary topics that will allow students to elect courses in departmental, systems, or general concentrations. It consists of six credit hours of required courses and six credit hours of elective core courses based on the applicant’s background.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AENG 500</td>
<td>Automobile: An Integrated Syst</td>
<td>3</td>
</tr>
<tr>
<td>AENG 587</td>
<td>Automotive Manuf Processes</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective Core Courses

Select from the following:

- AENG 502 Modeling of Automotive Systems
- AENG 505 Intro to Embedded Systems
- AENG 510 Vehicle Electronics I
- AENG 545 Vehicle Ergonomics I
- AENG 547 Automotive Powertrains I
- AENG 581 Materials Sel in Auto Design
- IMSE 515 Fundamentals of Program Mgt or IMSE 516 Project Management and Control or IMSE 517 Managing Global Programs
- AENG 596 Internal Combustion Engines I

Total Credit Hours 12

Concentration Courses

The program offers several concentration areas to meet the needs of individual students. The student may select the concentration based on his/her interest and background. The following concentrations are currently offered. Each student is required to take at least four courses (12 credit hours) in the concentration area.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ECE 515</td>
<td>Vehicle Electronics II</td>
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</tr>
<tr>
<td>ECE 530</td>
<td>Energy Storage Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 531</td>
<td>Intelligent Vehicle Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 532</td>
<td>Auto Sensors and Actuators</td>
<td></td>
</tr>
<tr>
<td>ECE 533</td>
<td>Active Automotive Safety Sys</td>
<td></td>
</tr>
<tr>
<td>ECE 5462</td>
<td>Elec Aspects of Hybrid Vehicle</td>
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</tr>
<tr>
<td>ECE 565</td>
<td>Digital Control Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 580</td>
<td>Digital Signal Processing</td>
<td></td>
</tr>
<tr>
<td>ECE 646</td>
<td>Adv Elec Drive Transportation</td>
<td></td>
</tr>
<tr>
<td>IMSE 519</td>
<td>Quan Meth in Quality Engin</td>
<td></td>
</tr>
<tr>
<td>IMSE 538</td>
<td>Intelligent Manufacturing</td>
<td></td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt and Six Sigma</td>
<td></td>
</tr>
<tr>
<td>IMSE 577</td>
<td>Human-Computer Interaction</td>
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<tr>
<td>IMSE 593</td>
<td>Vehicle Package Engineering</td>
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<tr>
<td>AENG 546</td>
<td>Vehicle Ergonomics II</td>
<td></td>
</tr>
<tr>
<td>AENG 589</td>
<td>Auto Assembly Systems</td>
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<tr>
<td>ME 537</td>
<td>Automotive Air Conditioning</td>
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</tr>
<tr>
<td>ME 543</td>
<td>Vehicle Dynamics</td>
<td></td>
</tr>
<tr>
<td>ME 545</td>
<td>Acoustics and Noise Control</td>
<td></td>
</tr>
</tbody>
</table>
Can enroll if Major is Automotive Systems Engineering
Can enroll if College is Engineering and Computer Science
Can enroll if Level is Doctorate or
Can enroll if Class is Doctorate

Restriction(s):
the dissertation defense. (1 to 9 credit hours per semester)

Corequisite(s):
follow-up discussion on the future trends in his/her field.
about his/her research or a pre assigned research topic, and lead a
addition, each Ph.D. student is required to present a one hour seminar
actively participate in seminars each semester until graduation. In
After attaining candidacy every Ph.D. student is required to attend and
hours of courses. This will require prior approval of a faculty advisor and
or
Students may elect AENG 698, a 3 credit hour or a 6-credit hour project,
AENG 698, a 6-credit hour master’s thesis, in lieu of equivalent credit
of courses. This will require prior approval of a faculty advisor and
the program director.

AENG 990 Doctoral Dissertation 1 to 9 Credit Hours
Dissertation work by a Ph.D. student who has been admitted to the
the candidacy status. The student must be registered during the semester of
the dissertation defense. (1 to 9 credit hours per semester)

Restriction(s):
Can enroll if Class is Doctorate
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

* An asterisk denotes that a course may be taken concurrently.

Students may elect AENG 698, a 3 credit hour or a 6-credit hour project,
or AENG 699, a 6-credit hour master’s thesis, in lieu of equivalent credit
hours of courses. This will require prior approval of a faculty advisor and
the program director.

AENG 798 Doctoral Seminar 0 Credit Hours
After attaining candidacy every Ph.D. student is required to attend and
actively participate in seminars each semester until graduation. In
addition, each Ph.D. student is required to present a one hour seminar
about his/her research or an a pre assigned research topic, and lead a
follow-up discussion on the future trends in his/her field.

Corequisite(s): AEG 990

Restriction(s):
Can enroll if Class is Doctorate
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Automotive Systems Engineering

Laboratory Facilities
The bioengineering laboratory is designed to provide students with
hands-on experience in tissue engineering, biomechanics, and
developing and characterizing biomaterials. The laboratory houses
standard equipment and facilities required for biomaterial development,
bioengineering testing, and tissue engineering. Equipment available
for biomechanical testing includes eight axial test machines, a high
rate tensile/compressive impact tester, a high speed imaging system,
environmental chambers, and assorted fixtures.

Faculty
The BENG program faculty are engaged in research in orthopaedic
biomechanics, human movement, ocular biomechanics, impact safety,
biomaterials, tissue engineering, hypoxia, protein engineering, cellular
engineering, biominalization, biomimetics, biopreservation,
bioprocessing, drug delivery, nanotheranostics, pharmaceutical
formulation, microspectroscopy, thermogravimetics, biophotonics,
microoptics, biosensors, MEMS, and microfluidics.

Assistantships/Financial Assistance
Research assistantships may be available to exceptionally qualified
students who are not otherwise employed. Tuition scholarships are
available to qualified full-time graduate students. Find out more about
bioengineering faculty and their research areas (http://umdearborn.edu/
cecs/departments/mechanical-engineering/our-faculty-research/).

Bioengineering
The Program
The master's degree in bioengineering is a 30-credit-hour program
designed to prepare students in an area of rapid growth and profound
impact on society. The curriculum consists of courses specifically
designed to provide a comprehensive background in the bioengineering
field. Bioengineering courses are 3 credit hours and most are offered in
the evening from 6:00 to 8:45 p.m.

Degree Requirements
The degree requirements for this program consist of a minimum of 30
graduate-level semester credit hours (beyond an undergraduate degree
from an accredited engineering program) and includes 6 credit hours of
core courses, 18 credit hours of bioengineering elective courses, and 6
credit hours of cognate elective courses.

Students eligible to pursue the Bioengineering 4+1 Option (https://
umdearborn.edu/cecs/departments/mechanical-engineering
undergraduate-programs/41-bioengineering-program/) may count
up to 9 credits in the graduate program toward their undergraduate
bioengineering major. Of these, only one cognate course is allowed. In
practice with the usual graduate student program rules, 4+1 students
may also transfer a maximum of 6 additional 500 level credits toward the
30-credit master’s degree.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter
terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Materials:
AENG 584 Lightweight Automotive Alloys
AENG 586 Design & Mfg: Ltwt Auto Mat
AENG 588 Design&Manufac for Environment
AENG 687 Adv Auto Mfg Processes
ME 582 Injection Molding
ME 583 Mechanical Behav of Materials
ME 584 Mechanical Behavior of Polymer
ME 587 Automotive Composites
ME 589 Composite Materials
ME 591 Degradation of Materials

With the approval of the advisor, a general concentration of twelve
credit hours may be satisfied by selecting courses in more than one
concentration

Total Credit Hours 12

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter
terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Bioengineering
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impact on society. The curriculum consists of courses specifically
designed to provide a comprehensive background in the bioengineering
field. Bioengineering courses are 3 credit hours and most are offered in
the evening from 6:00 to 8:45 p.m.

Degree Requirements
The degree requirements for this program consist of a minimum of 30
graduate-level semester credit hours (beyond an undergraduate degree
from an accredited engineering program) and includes 6 credit hours of
core courses, 18 credit hours of bioengineering elective courses, and 6
credit hours of cognate elective courses.

Students eligible to pursue the Bioengineering 4+1 Option (https://
umdearborn.edu/cecs/departments/mechanical-engineering
undergraduate-programs/41-bioengineering-program/) may count
up to 9 credits in the graduate program toward their undergraduate
bioengineering major. Of these, only one cognate course is allowed. In
practice with the usual graduate student program rules, 4+1 students
may also transfer a maximum of 6 additional 500 level credits toward the
30-credit master’s degree.

Laboratory Facilities
The bioengineering laboratory is designed to provide students with
hands-on experience in tissue engineering, biomechanics, and
developing and characterizing biomaterials. The laboratory houses
standard equipment and facilities required for biomaterial development,
bioengineering testing, and tissue engineering. Equipment available
for biomechanical testing includes eight axial test machines, a high
rate tensile/compressive impact tester, a high speed imaging system,
environmental chambers, and assorted fixtures.

Faculty
The BENG program faculty are engaged in research in orthopaedic
biomechanics, human movement, ocular biomechanics, impact safety,
biomaterials, tissue engineering, hypoxia, protein engineering, cellular
engineering, biominalization, biomimetics, biopreservation,
bioprocessing, drug delivery, nanotheranostics, pharmaceutical
formulation, microspectroscopy, thermogravimetics, biophotonics,
microoptics, biosensors, MEMS, and microfluidics.

Assistantships/Financial Assistance
Research assistantships may be available to exceptionally qualified
students who are not otherwise employed. Tuition scholarships are
available to qualified full-time graduate students. Find out more about
bioengineering faculty and their research areas (http://umdearborn.edu/
cecs/departments/mechanical-engineering/our-faculty-research/).

* An asterisk denotes that a course may be taken concurrently.
Bioengineering Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENG 521</td>
<td>Biomatls and Biochem Interface</td>
<td>3</td>
</tr>
<tr>
<td>BENG 526</td>
<td>Fundamentals of Drug Delivery</td>
<td>3</td>
</tr>
<tr>
<td>BENG 550</td>
<td>Biomed Optics and Biophotonics</td>
<td>3</td>
</tr>
<tr>
<td>BENG 551</td>
<td>Microfluidics</td>
<td>3</td>
</tr>
<tr>
<td>BENG 560</td>
<td>Nanobiosystems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>BENG 570</td>
<td>Advanced Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>BENG 571</td>
<td>Impact Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>BENG 575</td>
<td>Regenerative Engineering</td>
<td>3</td>
</tr>
<tr>
<td>BENG 595</td>
<td>Digital Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>BENG 600</td>
<td>Study or Research in BENG</td>
<td>1-3</td>
</tr>
</tbody>
</table>

1 The student has the option of electing a thesis in lieu of 6 credit hours of coursework in the bioengineering electives area.

Cognate Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 515</td>
<td>Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 551</td>
<td>Advanced Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 502</td>
<td>Electromag Theory &amp; Simul</td>
<td>3</td>
</tr>
<tr>
<td>ECE 545</td>
<td>Intro Robot Syst</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 580</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5831</td>
<td>Pat Rec &amp; Neural Netwks</td>
<td>3</td>
</tr>
<tr>
<td>ECE 585</td>
<td>Pattern Recognition</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 501</td>
<td>Human Factors &amp; Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 510</td>
<td>Probability &amp; Statistical Mod</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 514</td>
<td>Multivariate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 543</td>
<td>Industrial Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 544</td>
<td>Industrial Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 546</td>
<td>Safety Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

BENG 520  Adv Molecular and Cell Biology  3 Credit Hours
This course introduces the cell and molecular biology concepts from an engineering perspective and provides the foundation for modern biotechnology and bioengineering. This course is designed for a first year engineering graduate student to develop a comprehensive understanding of relevant applications in biology, including biochemical, cellular organizational, metabolic and genetics aspects. Advanced concepts including genomics, molecular biology, recombinant DNA technology and evolution are discussed. The course provides exposure to several key techniques used in biological engineering laboratories. Students will have chance to present and discuss individual application through team project. (YR)

Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is , Bioengineering

BENG 521  Biomatls and Biochem Interface  3 Credit Hours
The course will provide graduate-level foundation on biomaterials science and principles. Specifically, the course will involve discussion on the importance of surfaces and interfaces in biomaterial function and elements controlling host responses to materials, introduction to biomimetic and rational designing approaches, and develop critical analyses of biomaterials through reading research papers and developing projects. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Bioengineering
BENG 526  Fundamentals of Drug Delivery  3 Credit Hours
This course is designed to provide students with an understanding on the concepts in drug delivery from an engineering perspective. The course will cover drug delivery mechanisms, quantitative understanding of drug transport, nanotechnology, drug delivery devices, toxicity and immune response, FDA regulations, clinical trials and technology transfer. The course will conclude with a design project on nanoparticles development for targeted drug delivery. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 550  Biomedical Optics and Biophotonics  3 Credit Hours
The recent explosion of interest in minimally invasive medical diagnostics has been fueled in part by the development of novel optics and photonics techniques and instrumentation designed specifically for medical applications. A large number of optically-based imaging and sensing diagnostics are now in use in both the research laboratory and medical clinic. Topics include engineering design principles of optical instrumentation for medical diagnostics, elastic and inelastic light scattering theory and biomedical applications, confocal and multiphoton microscopy, light propagation and optical tomographic imaging in biological tissues, and design of minimally invasive spectroscopic diagnostics. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 551  Microfluidics  3 Credit Hours
Microscaled systems and devices have enhanced reaction rates, predictable fluidic mechanics, reduced reagent volumes, and also lowered cost of manufacturing. These advantages benefit many biomedical applications that require sensitive molecular detection in robust and economical devices. In this course, a range of microsystem techniques will be discussed, including those based on Microfluidics, BioMEMS, and Optofluidics. The lectures will meet twice a week, one hour each, and will be accompanied by student-driven design projects that will be conducted in 3-hour laboratories. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 560  Nanobiosystems Engineering  3 Credit Hours
Nanobiosystems Engineering is an emerging frontier in nanotechnology. It integrates materials science, bioengineering, physics and life science with the biological and biochemical applications. This fast-developing interdisciplinary field holds the promise to solve many of the medical problems of the future. The course will introduce advanced concepts related to nanomaterials and nanofabrication and their application in medicine. The course will also focus on design and development of nano-devices for the applications of pharmaceuticals and healthcare. Typical applications including nano-biosensor, targeted drug delivery, and tissue engineering will also be discussed. Students in Bioengineering will have chance to present and discuss individual application through team project. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 570  Advanced Biomechanics  3 Credit Hours
This course applies the field of orthopedics to biomechanics, analysis and design. Topics include: soft tissue biomechanics, human motion analysis including gait, orthopedic implants, fixation and reconstruction, head impact and injury, advanced bone models. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 571  Impact Biomechanics  3 Credit Hours
This course focuses on the understanding of the behavior of human organs, bone and tissue at their point of mechanical or functional failure. Topics will include research methods in injury biomechanics, injury tolerance of the structures and materials of the head, brain, spine, thorax, abdomen and extremities and injury prevention focusing on safety equipment. Federal motor vehicle safety standards will be discussed. (YR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 575  Regenerative Engineering  3 Credit Hours
This course will discuss principles of tissue engineering whereby the properties of stem as well as primary cells, growth factors, and extracellular matrix and their impact in the development of engineered tissue constructs will be explored. In addition, the course will also focus on supporting/enabling technologies typically utilized in engineering these constructs including nano-and micro-fabrication techniques, 3D printing, micro-patternning as well designing principles of bioreactors, and drug and gene delivery techniques. Additionally, various tissue engineering applications will be discussed including synthetic tissues and organs that are currently under development for regenerative medicine application. (YR)

Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

BENG 595  Digital Manufacturing  3 Credit Hours
This combined lecture and hands on project course aims to train students to optimize the interplay of materials, people, machines and profitability. The course introduces methods to identify product concepts with commercial potential. Student teams will perform market analysis and explore the intellectual property space around their ideas and rapidly iterate them into a final prototype via direct digital manufacturing (e.g., 3D CAD/CAM files manifested via digital printing or machining). Advanced instruction on direct digital manufacturing tools will be given, and customer response will be used as feedback. Early stage prototypes will progress into more sophisticated designs, scaling up (cost, pricing, tooling, process flow and automation) scenario planning for mass manufacturing as well as Failure Mode Effect Analysis (FMEA) will be discussed. (WYR)

Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Bioengineering

BENG 600  Study or Research in BENG  1 to 3 Credit Hours
Individual study or research in an area of bioengineering under supervision of a faculty member. The student will submit a written report at the close of the term. (YR)

Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
BENG 699  Master's Thesis  1 to 6 Credit Hours
Research project in the area of bioengineering conducted under supervision of a program faculty member. While guided by a faculty member, a student electing this course is expected to carry out the work him-or herself. Successful completion of the course requires completion and public defense of a written thesis. A student must satisfactorily complete all 6 credit hours, which can be distributed over multiple semesters. (YR)

Restriction(s): Can enroll if Level is Rackham or Graduate

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Computer and Information Science

Admission
Applicants for the MS in Computer and Information Science are required to meet the following requirements:

1. A bachelor's degree from an accredited institution with a grade point average of B or better. Applicants with lower GPAs may be granted conditional admission. Preference will be given to students with a background in Computer and Information Science, engineering, math and science.

2. Satisfactory completion of the following:
   a. Calculus I & II
   b. One course in probability and statistics or linear algebra
   c. Programming Language (Preferably C/C++ I & II)
   d. One course in data structures with algorithm analysis
   e. One course in computer architecture
   f. One course in operating systems

Note: Students may be admitted conditionally to make up the deficiencies in item 2. In this case, the applicant will be required to complete appropriate courses within two years from the date of entrance. These courses may not be used to satisfy degree requirements.

1. Two letters of recommendation, with at least one from a person familiar with the candidate's academic performance, are required. Copies of the applicant's undergraduate transcripts and degree must be submitted.

Degree Requirements
To satisfy the requirements for the MS degree in CIS, all students admitted to the program are expected to complete 30 semester hours of graduate coursework, with a cumulative grade point average of B or better. The program of study consists of core courses, electives and the project/thesis option.

1 Please contact the Computer and Information Science Department about the policy on the minimum grade for a course to satisfy graduation requirements.

Advanced Standing
Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution.

Master's Thesis Committee
A Master's Thesis committee consists of three full-time CIS faculty members, one of whom is the thesis advisor, and requires the approval of the CIS graduate committee. When deemed appropriate, the chair of the graduate committee may request, in the committee, the presence of an additional member from outside the department.

Course Requirements
The 30 semester hours of required graduate work are as follows:

Project Option

<table>
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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Core Courses</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Two Concentration Areas</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Cognate Courses</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>3</td>
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<tr>
<td></td>
<td>Total Credit Hours</td>
<td>30</td>
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</tbody>
</table>

Thesis Option

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core Courses</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>One Concentration Areas</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Cognate Courses</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>CIS Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Thesis</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours</td>
<td>30</td>
</tr>
</tbody>
</table>

Core
All students are required to take one course from each of the following three categories:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Category 1</td>
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<tr>
<td>CIS 505</td>
<td>Algorithm Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 535</td>
<td>Wireless Tech/Pervasive Cmptg</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Category 2</td>
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</tr>
<tr>
<td>CIS 527</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CIS 544</td>
<td>Computer and Network Security</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Category 3</td>
<td></td>
</tr>
<tr>
<td>CIS 574</td>
<td>Compiler Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 578</td>
<td>Advanced Operating Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration
Each student is required to take at least four courses from two of the following concentration areas:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 515</td>
<td>Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 551</td>
<td>Advanced Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 552</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 587</td>
<td>Computer Game Design and Impl</td>
<td>3</td>
</tr>
<tr>
<td>CIS 588</td>
<td>Computer Game Design II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 652</td>
<td>Info Visualiztn &amp; Comp Anim</td>
<td>3</td>
</tr>
<tr>
<td>CIS 527</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CIS 537</td>
<td>Advanced Netwrkng &amp; Dist Syst</td>
<td>3</td>
</tr>
<tr>
<td>CIS 540</td>
<td>Foundation of Info. Sec.</td>
<td>3</td>
</tr>
<tr>
<td>CIS 544</td>
<td>Computer and Network Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 546</td>
<td>Security&amp;Privacy Wireless Ntwk</td>
<td>3</td>
</tr>
<tr>
<td>CIS 548</td>
<td>Sec and Priv in Cloud Comp</td>
<td>3</td>
</tr>
<tr>
<td>CIS 549</td>
<td>Software Security</td>
<td>3</td>
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<tr>
<td>CIS 5570</td>
<td>Introduction to Big Data</td>
<td>3</td>
</tr>
<tr>
<td>CIS 559</td>
<td>Prin of Social Netwk Science</td>
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<tr>
<td>CIS 569</td>
<td>Wireless Sensor Networks</td>
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<td>CIS 571</td>
<td>Web Services</td>
<td>3</td>
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<td>CIS 584</td>
<td>Adv Comp Net Sec</td>
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<td>CIS 624</td>
<td>Res Adv Cmp Net Sec</td>
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<tr>
<td>CIS 647</td>
<td>Rsrch Advances Ntwkng&amp;Dist Sys</td>
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<tr>
<td>CIS 511</td>
<td>Natural Language Processing</td>
<td>3</td>
</tr>
<tr>
<td>CIS 534</td>
<td>Semantic Web</td>
<td>3</td>
</tr>
<tr>
<td>CIS 536</td>
<td>Information Retrieval</td>
<td>3</td>
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<tr>
<td>CIS 548</td>
<td>Sec and Priv in Cloud Comp</td>
<td>3</td>
</tr>
<tr>
<td>CIS 555</td>
<td>Dec Support and Expert System</td>
<td>3</td>
</tr>
<tr>
<td>CIS 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 5570</td>
<td>Introduction to Big Data</td>
<td>3</td>
</tr>
<tr>
<td>CIS 559</td>
<td>Prin of Social Netwk Science</td>
<td>3</td>
</tr>
<tr>
<td>CIS 579</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CIS 571</td>
<td>Web Services</td>
<td>3</td>
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<tr>
<td>CIS 572</td>
<td>Object Oriented Systems Design</td>
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</tr>
<tr>
<td>CIS 579</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CIS 525</td>
<td>Web Technology</td>
<td>3</td>
</tr>
<tr>
<td>CIS 535</td>
<td>Wireless Tech/Pervasive Cmptg</td>
<td>3</td>
</tr>
<tr>
<td>CIS 549</td>
<td>Software Security</td>
<td>3</td>
</tr>
<tr>
<td>CIS 550</td>
<td>Obj-Oriet Prog and Its Applic</td>
<td>3</td>
</tr>
<tr>
<td>CIS 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIS 556</td>
<td>Software Quality Assurance</td>
<td>3</td>
</tr>
<tr>
<td>CIS 566</td>
<td>Software Arch and Des Patterns</td>
<td>3</td>
</tr>
<tr>
<td>CIS 575</td>
<td>Software Engineering Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>CIS 577</td>
<td>S/W User Interface Dsgn&amp;Analys</td>
<td>3</td>
</tr>
<tr>
<td>CIS 580</td>
<td>Data Analytics in Software Eng</td>
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<td>Computer Game Design II</td>
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<tr>
<td>CIS 678</td>
<td>Research Advances Software Eng</td>
<td>3</td>
</tr>
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<td>CIS 505</td>
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<td>CIS 559</td>
<td>Prin of Social Netwk Science</td>
<td>3</td>
</tr>
<tr>
<td>CIS 562</td>
<td>Web Information Management</td>
<td>3</td>
</tr>
<tr>
<td>CIS 624</td>
<td>Res Adv Cmp Net Sec</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours:** 270

1 May not be used as concentration course if counted as core course.
Cognate

Students can take any graduate-level courses approved by the student's advisor, as described in the requirements for graduation.

Project Option

Students must take CIS 695, Master's Project for 3 credit hours.

- Core courses - 9 credit hours
- Two concentration areas - 12 credit hours
- Cognate courses - 6 credit hours
- Project - 3 credit hours

Thesis Option

Students must take a CIS elective course for 3 credit hours and CIS 699, Master's Thesis for 6 credit hours.

- Core courses - 9 credit hours
- One concentration area - 6 credit hours
- Cognate courses - 6 credit hours
- CIS elective course - 3 credit hours
- Thesis - 6 credit hours

The Ph.D. CIS program will follow the guidelines of the Rackham Graduate School and consists of at least 36 credits of coursework beyond the bachelor's degree and at least 24 dissertation credits.

There are three types of students who will be admitted to the Ph.D. CIS program:

- Students with just a B.S. in computer and information science or closely related area
  - Complete at least 36 credit hours of coursework, including 30 credit hours toward the completion of the MS degree, and at least 24 dissertation credits, and can earn an M.S. CIS, M.S. DS, or M.S. SWE along the way to their Ph.D. CIS.
- Students with a relevant Rackham or a UM-Dearborn master’s degree
  - Complete at least 6 credits of coursework and at least 24 dissertation credits.
- Students with a relevant non-Rackham and non-UM-Dearborn master’s degree
  - Complete at least 18 credits of coursework and at least 24 credits of thesis research.

Each student is guided by a research advisor and a dissertation committee and has to pass the following major milestones:

- Identifying the faculty advisor and research topic
- Completion of required coursework
- Passing the qualifying examination consisting of two parts:
  - Curriculum exam
  - Research proficiency exam
- Advancement to candidacy
- Forming the dissertation committee
- Passing the dissertation proposal examination
- Completion of required research credit hours
- Preparation of a written dissertation and its oral defense

The target typical time of degree completion is five (5) years.

Step 1: Qualification

In addition to fulfilling the following coursework requirements, a Ph.D. student must have:

- a 3.5/4.0 GPA overall and a 3.5/4.0 GPA for all CIS courses to sign up for these exams
- A working relationship with a CIS faculty member as a research advisor

Breadth Requirement (https://umdearborn.edu/)

The breadth requirement is satisfied by taking three courses (9 credit hours), one from each of three of the four concentration areas below. All Ph.D. breadth courses must be completed with a grade of B+ or better within 3 full terms (1.5 years) for a full-time student with a relevant Master’s degree or 4 full terms (2 years) for all other full-time students.

Depth Requirement (https://umdearborn.edu/)

The depth requirement is satisfied by taking four courses (12 credit hours). At least one and at most two of these courses can be CIS 791—Advanced Guided Study for Doctoral Students (Directed Study course below). The remainder of these courses must be in the same concentration area, below, and must be different from the courses taken for the breadth requirement. Each of these Ph.D. depth courses must be completed with a grade of A- or better and may not be completed via equivalency. At least one of these courses must be 600-level.

Mathematics Requirements (https://umdearborn.edu/)

The student must take CIS 505 (Algorithm Design and Analysis) and at least one other advanced mathematics course. CIS 505 must be taken within the first two semesters after enrollment in the Ph.D. CIS program. These latter mathematics courses can be used to meet the cognate course requirement. The other required mathematics course must be selected from the list provided below.

- MATH 504: Dynamical Systems
- MATH 5055: Integral Equations
- MATH 512: First Course in Modern Algebra
- MATH 514: Numerical Solutions of Partial Differential Equations
- MATH 515: B-Splines and Their Applications
- MATH 516: Partial Differential Equations
- MATH 520: Stochastic Processes
- MATH 525: Mathematical Statistics II
- MATH 551: Advanced Calculus I
- MATH 552: Advanced Calculus II
- MATH 554: Fourier Series and Boundary Value Problems
- MATH 555: Functions of a Complex Variable with Applications
- MATH 558: Introduction to Wavelets
- MATH 562: Mathematical Modeling
- MATH 583: Discrete Optimization
- MATH 584: Applied and Algorithmic Graph Theory
- MATH 592: Introduction to Topology
- STAT 530: Applied Regression Analysis
- STAT 535: Data Analysis and Modeling
- STAT 545: Reliability and Survival Analysis
- STAT 590: Topics in Applied Statistics
These latter mathematics courses can be used to meet the cognate course requirement.

Elective Requirement (https://umdearborn.edu/)

The remaining CIS coursework must be chosen from the concentration area courses, below (*indicates a course in the planning stages).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Data Management</td>
<td><strong>Semantic Web</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 534</td>
<td><strong>Information Retrieval</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 536</td>
<td><strong>Database Systems</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 556</td>
<td><strong>Web Information Management</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 562</td>
<td><strong>Wireless Sensor Networks</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 565</td>
<td><strong>Advanced Data Management</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 568</td>
<td><strong>Research Advances in Data Mgt</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 555</td>
<td><strong>Dec Support and Expert System</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 557</td>
<td><strong>Introduction to Big Data</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 559</td>
<td><strong>Prin of Social Netwk Science</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 568</td>
<td><strong>Data Mining</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 570</td>
<td><strong>Advanced Data Mining</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 579</td>
<td><strong>Artificial Intelligence</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 585</td>
<td><strong>Adv AI</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 679</td>
<td><strong>Computational Game Theory</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 685</td>
<td><strong>Res Adv in Art Intell</strong></td>
<td>3</td>
</tr>
<tr>
<td>2. Data Science</td>
<td><strong>Computer Networks</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 527</td>
<td><strong>Wireless Tech/Pervasive Cmptg</strong></td>
<td>3</td>
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<tr>
<td>CIS 537</td>
<td><strong>Advanced Netwrkng &amp; Dist Syst</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 544</td>
<td><strong>Computer and Network Security</strong></td>
<td>3</td>
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<tr>
<td>CIS 546</td>
<td><strong>Sec and Priv in Cloud Comp</strong></td>
<td>3</td>
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<tr>
<td>CIS 548</td>
<td><strong>Inf Vis &amp; Multimedia Gaming</strong></td>
<td>3</td>
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<tr>
<td>CIS 563</td>
<td><strong>Modeling of Computer-based Sys</strong></td>
<td>3</td>
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<tr>
<td>CIS 571</td>
<td><strong>Web Services</strong></td>
<td>3</td>
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<tr>
<td>CIS 574</td>
<td><strong>Compiler Design</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 578</td>
<td><strong>Advanced Operating Systems</strong></td>
<td>3</td>
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<tr>
<td>CIS 584</td>
<td><strong>Adv Comp Net Sec</strong></td>
<td>3</td>
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<tr>
<td>CIS 647</td>
<td><strong>Rsrch Advances Ntwkng &amp; Dist Sys</strong></td>
<td>3</td>
</tr>
<tr>
<td>3. Systems and Security</td>
<td><strong>Computer Networks</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 527</td>
<td><strong>Wireless Tech/Pervasive Cmptg</strong></td>
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<td>3</td>
</tr>
<tr>
<td>4. Software Engineering</td>
<td><strong>Software Engineering</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 533</td>
<td><strong>Software Quality Assurance</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 555</td>
<td><strong>Software Arch and Des Patterns</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 575</td>
<td><strong>Software Engineering Mgmt</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 577</td>
<td><strong>S/W User Interface Dsgn &amp; Analys</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 580</td>
<td><strong>Data Analytics in Software Eng</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 587</td>
<td><strong>Computer Game Design and Impl</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 588</td>
<td><strong>Computer Game Design II</strong></td>
<td>3</td>
</tr>
<tr>
<td>CIS 678</td>
<td><strong>Research Advances Software Eng</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

Directed Study (https://umdearborn.edu/)

A commitment from an approved CIS faculty member to act as one’s research advisor is a requirement of the qualification stage. All students who aspire to receive a Ph.D. must demonstrate a potential for conducting original research. This is accomplished by completing either 3 or 6 credit hours of a research-oriented directed study (CIS 791—Advanced Guided Study for Doctoral Students) prior to the Research Proficiency Exam. These must be taken while in residence on the UM-Dearborn campus.

Ph.D. students must complete 3 credits of CIS 791 within their first two semesters (Fall and Winter Semesters) of the Ph.D. CIS program.

Ph.D. Research Seminar

This seminar will be offered in the fall and winter semesters.

Continuous attendance will be required of all program students, including those at the pre-candidacy level. The focus will be on reports by students on the status of their research projects. Occasional presentations by guest speakers will also be included. This seminar will have no credit hours. Passing the course will be based on participation and attendance.

Ph.D. Research Methodology Seminar

This course must be completed within the first two semesters after enrolling into the program. The seminar will include the required training in responsible conduct of research and scholarship. This seminar will carry no credit hours. Passing is based on participation and attendance, with the exception of the Responsible Conduct of Research and Scholarship Training module of the Methodology seminar, for which a test will be required.

Cognate Credits

At least 4 credit hours of coursework must be outside the computer and information science area. The second mathematics class (see above) can be used to satisfy all or part of this requirement. Other ways of satisfying this requirement are:

- Completion of at least four credit hours of approved cognate credits, which must be from outside the CIS department. The minimum acceptable grade for a cognate course is a B.
- Completion of a University of Michigan Master’s degree, which includes a cognate component. This coursework must have been completed no more than 5 years before admission to the CIS Ph.D. Program.
- Completion of a relevant Master’s degree from another university which had coursework that meets the expectation of the program cognate requirement, without transferring the credit to the transcript. This coursework must have been completed no more than 5 years before admission to the CIS Ph.D. Program. These courses do not apply toward the minimum 18 (or 36) credit hours required for the degree and do not appear on the University transcript.

Qualifying Exam

There are two qualification exams, and they should be taken in sequence: the Curriculum Exam and the Research Exam. To take these exams, a student must have an overall and CIS GPA of at least 3.5 and will be given two attempts to pass each exam.

Once all the requirements for Qualification have been met, a decision whether the student is qualified to continue in the Ph.D. Program is made by vote of the CIS Faculty in attendance.
Curriculum Exam:

The goal of this examination will be to ensure that students have a good understanding of the fundamentals of Computer and Information Science in the broad area of their research. The examination committee will be selected from the Graduate Faculty by the Ph.D. Program Committee. The examination will include the following steps:

1. The student selects three (3) CIS graduate courses during the first semester of the program. One course should be in the area of the student's research. The two other courses should be in separate areas.
2. These three (3) courses should be approved by the Ph.D. CIS program committee to ensure that the student has proper fundamental knowledge in CIS for his/her study in the program.
3. For each of the three courses, if the student receives at least an A- in this course, the written exam is waived. However, if the student receives a grade lower than A- in this course, a 1-hour-long written exam on the course material, together with the underlying undergraduate material, is taken by the student.
4. For students who do not pass this exam in the first time, an additional oral exam is conducted.

Research Proficiency Exam:

The student’s ability to conduct independent research is evaluated through a written report of a project done in CIS 791, followed by a 90-minute oral exam by three faculty members. The student’s research advisor cannot be among the three faculty. The Ph.D. CIS committee selects the three faculty members based on the student’s research area. The student should prepare a 45-minute presentation, followed by up to 45 minutes of questions. Examiners will be given the written report on the Directed Study at least one week before the examination, and each examiner will submit a written report on the examination. The student must submit four copies of the written report to the Ph.D. CIS program committee director at least one week before the research proficiency exam.

Step 2: Candidacy

The decision to admit a student to Candidacy is based on the following,

- The CIS Qualification process has been completed successfully
- Completion of at least a 4-credit cognate course with a grade of at least B

A student must apply for candidacy by submitting the appropriate forms to the CIS Ph.D. Program Director before the term in which the student plans to become a candidate. Candidacy is not awarded automatically; it must be applied for. The achievement of candidacy is considered an important milestone in a Ph.D. student’s progress. A full-time student with a relevant Master’s degree is making satisfactory progress if candidacy is achieved after 3 full terms (1.5 years) and must be achieved after 4 full terms (2 years). Other full-time students are making satisfactory progress if candidacy is achieved after 6 full terms (2.5 years) and must be achieved within 6 full terms (3 years). Part-time students are making satisfactory progress if candidacy is achieved after 7 full terms (3.5 years) and must be achieved within 8 full terms (4 years).

Step 3: Dissertation and Defense

Dissertation and Defense for the CIS Ph.D. requires the following:

- Identify a research advisor and agree on an appropriate topic
- Identify a doctoral committee
- Submit and defend a proposal for the doctoral research content
  - Dissertation Proposal Examination
- Do the research and write the dissertation
- Submit and defend the dissertation

The Dissertation Committee (https://umdearborn.edu/)

The Dissertation Committee will consist of the chair and at least three other members. The student’s dissertation advisor will serve as chair. Of the additional members, two must hold at least 50% appointment as tenured or tenure-track faculty of the Computer and Information Science Department, with at least one being a member of the graduate faculty. The third committee member must be from outside the department: a faculty from another department or another university or an expert from industry.

The composition of the Dissertation Committee has to be approved by the Ph.D. Program Committee.

Dissertation Proposal Examination (https://umdearborn.edu/)

The next important step of the Dissertation and Dissertation Defense stage will be the Dissertation Proposal Examination. The main objective is to ensure that the proposed research topic, as well as the student’s background and relevant knowledge, are of sufficient strength.

The examination will consist of a written Dissertation Proposal and a presentation open to the public by the student. The examination will be conducted by the Dissertation Committee formed by the Ph.D. Program Committee. As a rule, the Dissertation Committee will continue overseeing the student’s work to the stage of final dissertation defense.

Dissertation Defense (https://umdearborn.edu/)

After the initial requirements are met, the student may proceed with the dissertation research and the writing of the dissertation. The dissertation should document the original contributions made by the candidate as a result of independent research. This research work should be of archival quality. In advance of graduation, the dissertation must be approved by all the members of the student’s dissertation committee. To obtain this approval a student must submit a written copy of the dissertation to the dissertation committee and defend the research work at a final oral examination open to other faculty, students, and the interested public.


Students are expected to complete the degree within two years of passing the dissertation proposal exam, but no more than seven years from the date of the first enrollment in the Ph.D. CIS program. The Ph.D. CIS committee conducts annual reviews to evaluate progress toward degree completion. Students defending the dissertation must be registered in the 990 Dissertation Research course.

Copies of the dissertation, approved by the student’s research advisor, must be provided to the committee at least two weeks before the oral defense. Copies of the dissertation given to the committee should be in final form and must meet campus dissertation guidelines (https://
Dissertation committee members are required to submit written evaluations of the student’s dissertation prior to the oral defense. The dissertation committee members must be present at the dissertation defense. Since the defense examination includes the formal public presentation of the dissertation research, it will be publicized throughout the college and the university. The time between passing the Dissertation Proposal Examination and the dissertation oral defense should be at least 14 weeks.

Publicaion of Research (https://umdearborn.edu/)

The Ph.D. CIS program is designed to give a student a comprehensive and in-depth knowledge of the computer and information science field, as well as training in research methods. Therefore, based on the student’s dissertation research, the student is required to have published at least 1 paper in a top-quality, peer-reviewed, professional conference or journal in the field, prior to scheduling the final oral examination. The department will provide a list of acceptable top-quality conferences and journals in all CIS research areas.

Time Limit for Completing the Degree (https://umdearborn.edu/)

The CIS Ph.D program has a time limit of 7 years. Full-time students are expected to complete the degree within five years of achieving candidacy, but no more than seven years from the date of the first enrollment in the CIS Ph.D program. Students who have not completed their degree within the seven-year limit may petition the CIS Ph.D Program Committee for an extension of time to degree with a plan for completion. A student who does not complete the degree after two years of extension may be returned to pre-candidacy status and required to meet candidacy requirements again.

CIS 505  Algorithm Analysis and Design  3 Credit Hours
This course investigates how to design efficient algorithms. Topics covered include: asymptotic analysis, average-case and worst-case analysis, recurrence analysis, amortized analysis, classical algorithms, computational complexity analysis, NP-completeness, and approximation algorithms. In addition, the course investigates approaches to algorithm design including: greedy algorithms, divide and conquer, dynamic programming, randomization, and branch and bound.
Prerequisite(s): CIS 350
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

CIS 510  Computer Interfacing  3 Credit Hours
This course covers fundamentals of computer interfacing to the external world through the following: parallel and serial interfaces, timers, interrupts, Uart, and Duart. Programming aspects will be emphasized. Knowledge of an assembly language required. (YR).
Prerequisite(s): CIS 310

CIS 511  Natural Language Processing  3 Credit Hours
This course proves an introduction to the theory and practice of natural language processing (NLP), as well as the approaches that allow understanding, generating, and analyzing natural language. The course will cover the three major areas in NLP: syntax, semantics, and pragmatics. The course will introduce both knowledge-based and statistical approaches to NLP; illustrate the use of NLP techniques and tools in a variety of application areas, and provide insight into many open research problems. (YR)
Prerequisite(s): CIS 350 or CIS 3501

CIS 515  Computer Graphics  3 Credit Hours
Basic geometrical concepts, graphics primitives, two-dimensional transformations, segmented files, windowing and clipping, camera models, and 3-D viewing transformations. (F).
Prerequisite(s): (CIS 350 or IMSE 350 or CCM 350) and (MATH 217 or MATH 227) and (MATH 205 or MATH 215)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

CIS 525  Web Technology  3 Credit Hours
This course deals with the study of the technologies used to design and implement multimedia web sites. Topics include web servers, HTML, CGI, scripting languages, Java applets, back-end database connectivity, web security, multimedia, XML, web services,.NET, semantic web. (YR).
Prerequisite(s): CIS 553*
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

CIS 527  Computer Networks  3 Credit Hours
To study the technical and management aspects of computer networks and distributed systems. Topics include: communication hardware, communication protocols, network architectures, local area networks, distributed database systems. Case studies and research project will be assigned for additional insight.
Prerequisite(s): CIS 450 or IMSE 450 or ECE 478
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 534  Semantic Web  3 Credit Hours
The aim of this course is to investigate the fundamental concepts, techniques, and technologies for enabling the envisioned semantic Web. The topics to be covered include ontologies, domain modeling, logic, reasoning and inference techniques, semantic Web services, and ontology interoperation/mappings. We will review major semantic web research projects, as well as current technologies for enabling the semantic web.
Prerequisite(s): CIS 556
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science
CIS 535  Wireless Tech/Pervasive Cmptg  3 Credit Hours
This course covers contemporary technologies for programmable mobile and wireless intelligent hand-held devices. Students will get an overview of mobile operating system concepts/techniques and will learn how to develop software for mobile/smart devices, with particular emphasis on the constraints intrinsic to such devices. Topics in location-based services and pervasive computing will also be covered. Participation in a project is a requirement in this course. This class requires knowledge in computer programming.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 536  Information Retrieval  3 Credit Hours
This course covers techniques for locating relevant semi-structured or unstructured documents, residing in a large document repository, satisfying various information needs. Particular attention will be paid to repositories of text documents or web pages. Participation in a project is a requirement in this course.
Prerequisite(s): CIS 505
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 537  Advanced Netwrkng & Dist Syst  3 Credit Hours
This course focuses on the design, implementation, analysis, and evaluation of large-scale networked systems. Specific networking topics include congestion/flow control, traffic analysis, routing, internetworking, multicast, mobile and wireless networks, quality of service, and security. Fundamental distributed systems topics include domain name service, global routing protocols, content delivery networks, and peer-to-peer systems.
Prerequisite(s): CIS 427 or CIS 527
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 540  Foundation of Info. Sec.  3 Credit Hours
This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features. The purpose of the course is to provide the student with an overview of the field of information security and assurance. Students will be exposed to the spectrum of security activities, methods, methodologies, and procedures. Coverage will include inspection and protection of information assets, detection of and reaction to threats to information assets, and examination of pre- and post-incident procedures, technical and managerial responses, and an overview of the information security planning and staffing functions.
(F,YR)
Restriction(s):
Can enroll if Level is Graduate

CIS 544  Computer and Network Security  3 Credit Hours
The course will provide a broad spectrum introduction of the fundamental principles of computer and network security. Topics will include security policies, models and mechanism for confidentiality, integrity and availability, access control, authorization, cryptography and applications, threats and vulnerabilities in computer networks, key management, firewalls and security services in computer networks.
Prerequisite(s): CIS 450 or IMSE 450 or ECE 478
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 545  Data Security and Privacy  3 Credit Hours
With the continuing proliferation of ways to collect and use information about people, there is a great concern whether such use of information about people affects privacy adversely. This course covers basics of data security and privacy techniques which can facilitate the use of data in a secure and privacy-sensitive way. Topics include security and privacy challenges due to big data collection and analytics, technologies and strategies for data security and privacy (access control mechanism, integrity policy, cryptography and encryption, notice and consent, anonymization or de-identification, deletion and non-retention). (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

CIS 546  Security&Privacy Wireless Ntwk  3 Credit Hours
This course focuses on security issues in wireless networks, such as cellular networks, wireless LANs, mobile ad-hoc networks, vehicular networks, sensor networks, and RFID. The course will first present an overview of wireless networks, then focus on attacks and discuss proposed solutions and their limitations.
Prerequisite(s): CIS 527 or CIS 544
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 548  Sec and Priv in Cloud Comp  3 Credit Hours
This course covers the major security and privacy topics in cloud computing. The goals of this course are to familiarize students with the major security and privacy issues and challenges associated with cloud computing, and to show them how to address them. Topics include outsourced storage security and privacy, outsourced computation security and privacy, secure virtualization and cloud platform security, trusted cloud computing technology, key management in the cloud, cloud forensics, cloud-related regulatory and compliance issues, and business and security risk models.
Prerequisite(s): (CIS 477 or CIS 544) and ECE 528
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 549  Software Security  3 Credit Hours
This course provides a broad-spectrum introduction to the fundamental principles of software security, as well as the approaches that allow understanding common software security practices, analyzing programs for vulnerabilities, and methods for developing secure software systems. The course will cover three major areas: software attacks and defenses, program analysis, and software verification. Various forms of software will be considered in this class including high level applications and system software. The course will also provide insight into many open research problems in this area. (F,YR)
Prerequisite(s): CIS 350 or CCM 350 or CIS 3501 or ECE 371 or IMSE 350
Restriction(s):
Can enroll if Level is Graduate

CIS 550  Obj-Oriet Prog and Its Applic  3 Credit Hours
This course covers advanced programming techniques using objects and classes, including programming windows, menus, toolbars, and drawing in windows. Further applications include distributed computing in which client and server communicate with each other by sending messages.
Prerequisite(s): CIS 350
CIS 551 Advances Computer Graphics  3 Credit Hours
Prerequisite(s): CIS 515

CIS 552 Inf Vis & Multimedia Gaming  3 Credit Hours
This course introduces basic techniques for digital animation, computer and video games, and web multimedia. Topics include the process of creating animated video clips from start to finish, including story creation, storyboarding, modeling, animation, and post-production; several key techniques for video editing and motion generation, including keyframe, motion capture editing, collision detection, particle systems, physical simulation, and real-time rendering; techniques for web animation and multimedia; and internet gaming.
Prerequisite(s): CIS 515 or CIS 587
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 553 Software Engineering  3 Credit Hours
Program design methodologies; control flow and data flow in programs; program measurement. Software life cycle; large program design, development, testing, and maintenance. Software reliability and fault tolerance. Evolution dynamics of software. (YR).
Prerequisite(s): CIS 375
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 554 Info Sys Analysis and Design  3 Credit Hours
To analyze the information needs of organizations and design suitable information systems to meet their needs. Topics include: systems analysis and design techniques related to analyzing and determining information needs, feasibility studies, designing input/processing/output systems, and hardware/software development and evaluation.
Prerequisite(s): CIS 350

CIS 555 Dec Support and Expert System  3 Credit Hours
To study the application of artificial intelligence in building decision support and expert systems for management and other applications. Topics include: fundamentals of artificial intelligence, knowledge representation and knowledge processing, tools for building expert systems and decision support system design. (YR).
Prerequisite(s): CIS 350 or IMSE 350 or CCM 350
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 556 Database Systems  3 Credit Hours
An examination of the database approach to data management in computer systems. Topics include database fundamentals, the relational, network, and hierarchical database models, normalization of data, distributed databases, and current trends and issues. (YR).
Prerequisite(s): CIS 350 or IMSE 350 or CCM 350
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 5570 Introduction to Big Data  3 Credit Hours
This course provides an overview of what big data is and explores its characteristics. It introduces the fundamental technologies, platforms, and methods that enable Big Data analysis, and covers how to acquire, store, and analyze very large amounts of information to complete Big Data analysis tasks. Students will gain hands-on experience in real-world applications of Big Data such as in cyber-physical systems and health informatics. Most of the work in this course will be team-based and task-oriented.
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

CIS 559 Prin of Social Netwk Science  3 Credit Hours
This course presents an in-depth study of various types of information networks, which range from the structure and behavior of the world-wide web, to the structure and behavior of various collaboration networks, such as bibliographic citations, viral marketing, and online social networks. Using concepts from graph theory and game theory, topics include small-world networks, scale-free networks, the structure of the web, link analysis and web search, and influence networks.
Prerequisite(s): CIS 505
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 560 Electronic Commerce  3 Credit Hours
This course examines how new information technologies and networks affect the exchange of goods and services between buyers and sellers in firms. What are economics of different electronic commerce models for firms? The course combines critical evaluation of business strategies with hands-on experience in building supporting electronic commerce systems utilizing electronic data interchange (EDI) software. (YR).
Prerequisite(s): CIS 564 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

CIS 562 Web Information Management  3 Credit Hours
This course provides an in-depth examination of advances in web information management, retrieval and applications. Topics covered include: web interfaces to databases, XML standards, web database design, web database architectures, web query languages, web data restructuring, web information integration, semantic web and ontologies, and web mining. (YR)
Prerequisite(s): CIS 556 or CIS 421
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

CIS 563 Modeling of Computer-based Sys  3 Credit Hours
The purpose is to expose the students to modeling and simulation concepts and methodologies to use modeling and simulation as a tool for both the analysis of systems and the development of their information systems support.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Computer & Information Science
CIS 564  Enterprise Information Systems  3 Credit Hours
The purpose of this course is to provide a foundation for the analysis, design and implementation of enterprise information systems. Topics include systems and organization theories, and information systems planning and evaluation. Students will be also introduced to various systems development life cycle phases of an enterprise information system. Students will acquire an understanding of the flow of information (forecasts, financial, accounting and operational data) within an enterprise and the factors that should be considered in designing an integrated enterprise information system. This includes all systems in the business cycle from revenue forecasts, production planning, inventory management, logistics, manufacturing, accounts payable, sales, accounts receivable, payroll, general ledger and report generation. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 applications development software suite. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

CIS 565  Software Quality Assurance  3 Credit Hours
This course focuses on the processes, methods, and techniques for developing quality software, and maintaining quality software. Software testing processes at the unit, module, subsystem, and systems levels are discussed. Testing methods covered include: automatic and manual generation of test data, static vs. dynamic analysis, functional testing, inspections, and reliability assessment.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 566  Software Arch and Des Patterns  3 Credit Hours
A design pattern is a catalogued solution that has been applied and tested in multiple situations to produce well-designed reusable object-oriented software. This course covers both architectural and software design patterns in theory and in practice, with various applications. The course will end with a case study and design exercise demonstrating identification and utilization of architectural design patterns in real world application. The students will test their understanding by completing three projects utilizing popular design patterns and a term project utilizing multitude of patterns. Class presentation of published advanced patterns may be required.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 568  Data Mining  3 Credit Hours
Advances in computer information systems, machine learning, statistics, and intelligent systems and methodologies for the automatic discovery of knowledge from large high-dimensional databases. This course also uses engineering development tools such as neural networks, fuzzy logic, and genetic algorithms.
Prerequisite(s): ECE 479 or CIS 479
Restriction(s):
Can enroll if College is Engineering and Computer Science

CIS 569  Wireless Sensor Networks  3 Credit Hours
This course provides students with an overview of wireless sensor networks and the issues related to their design and implementation. It introduces students to the state-of-the-art in wireless sensor networking and helps them solve problems in designing and deploying resource-limited sensor networks for real-world sensing applications. During this course, students are required to work in teams to design and implement some primitive sensing applications.
Prerequisite(s): CIS 527
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 570  Advanced Data Mining  3 Credit Hours
This course provides an in-depth study of advanced data mining, data analysis and pattern recognition concepts and algorithms. Course content builds upon a first data mining course and explores advanced machine learning algorithms, high-dimensional data, graph and temporal data, and advanced methods and applications to deal with dynamic stream data. Various applications will be considered, including social networks and health informatics. Students will be able to understand the research methods applied in the field and conduct an end-to-end data mining project and document and present the results.
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

CIS 571  Web Services  3 Credit Hours
A study of the major concepts and techniques for enabling web service-based interactions on the web. The objective is to familiarize students with the recent trends in industry and academia to address web service research issues. The course will address various aspects of web services, including the reference model for web services (UUDI, SOAP WSDL), web service composition, semantic web services, security/privacy issues in web services and an overview of web service standards (BPEL4WS, WS-Security, etc.). Students will participate in a major project.
Prerequisite(s): CIS 350 or ECE 370
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

CIS 572  Object Oriented Systems Design  3 Credit Hours
Students will be introduced to fundamental concepts and methods of object design and development. Topics that will be covered include object database concepts, data models, schema design (conceptual schema and physical schemas), query languages, physical storage of objects and indexes on objects, version management, schema evolution and systems issues such as concurrent control and recovery from failure. For application programming, a programming language such as C++ will be used for database design and query language. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

CIS 574  Compiler Design  3 Credit Hours
Lexical analysis and symbol table; syntactical analysis of expressions and statements; error detection; translation into intermediate code and its correctness. (YR).
Prerequisite(s): CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
**CIS 575  Software Engineering Mgmt  3 Credit Hours**
Quantitative models of the software lifecycle; cost-effectiveness; uncertainty and risk analysis; planning and modeling a software project; software cost estimation (COCOMO, Function points); software engineering metrics; software project documentation. Special emphasis on emerging software process standards such as the Capability Maturity Model of the Software Engineering Institute, and other international ones.
**Prerequisite(s):** CIS 553

**Restriction(s):**
Can enroll if College is Engineering and Computer Science

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**CIS 577  S/W User Interface Dsgn&Analys  3 Credit Hours**
This course introduces current theory and design techniques concerning how user interface (UI) and user experience (UX) should be designed and assessed to be easy to learn and use. Course includes flowing general modules: introduction of HCI & UX, Interface/Interaction design strategy; Advanced Issues in HCI; and Evaluation methods.

**Prerequisite(s):** CIS 553*

**Restriction(s):**
Can enroll if College is Engineering and Computer Science

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**CIS 578  Advanced Operating Systems  3 Credit Hours**
Advanced techniques used in operating system design. Distributed operating systems. Message-based operating systems. Operating systems for parallel architectures. Layered techniques in operating systems. Formal models of operating systems. Current trends in operating system design. (YR).

**Prerequisite(s):** CIS 450 or IMSE 450 or ECE 478

**Restriction(s):**
Can enroll if College is Engineering and Computer Science

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**CIS 579  Artificial Intelligence  3 Credit Hours**
This course introduces students to the essential concepts, methods, and techniques of artificial intelligence (AI) from a computer science perspective. The general topics of the course will include a variety of knowledge representations and algorithms for interference, decision-making, planning, and learning. Modern intelligent systems, including those that can handle uncertainty, will serve to motivate the course material. The course will cover topics at a depth appropriate for an introductory AI course at the graduate level. A student project may be required.

**Prerequisite(s):** CIS 350 or CIS 3501 or IMSE 350 or (ECE 370 and MATH 276)

**Restriction(s):**
Can enroll if Class is Post-baccalaureate NCFD or Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

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**CIS 580  Data Analytics in Software Eng  3 Credit Hours**
Full Course Title: Data Analytics in Software Engineering-This course focuses on state-of-the-art methods, tools, and techniques for evolving software. Topics such as reverse engineering, design recovery, program analysis, program transformation, refactoring, and traceability will be covered. There will be a project in which student teams participate.

**Prerequisite(s):** CIS 553

**Restriction(s):**
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Engineering and Computer Science

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**CIS 584  Adv Comp Net Sec  3 Credit Hours**
This course consists of an in-depth examination of current technological advancements in computer and network security. Topics will include secure group communication (key generation, distribution, and management), secure routing and multicasting, identity-based encryption, digital signatures, broadcast authentication, device pairing, and malware/intrusion detection and mitigation.

**Prerequisite(s):** CIS 544

**Restriction(s):**
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

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**CIS 585  Adv AI  3 Credit Hours**
This course will cover the most recent advances in the theory and practice of artificial intelligence, from a computer-science perspective. Topics covered will include the state-of-the-art in knowledge representation, uncertainty, learning, CSPs, graphical models, multi-agent systems, algorithms and heuristics, and propagation-based techniques. Various application areas will be taken from security, game theory, economics, finance, biology, sociology, and big data. (W)

**Prerequisite(s):** CIS 579

**Restriction(s):**
Can enroll if Level is Graduate or Doctorate or Rackham or

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**CIS 586  Advanced Data Management  3 Credit Hours**
This course provides an in-depth examination of some advanced database technologies. Topics are selected from: object-relational databases, active databases, distributed databases, parallel databases, deductive databases, fuzzy databases, data warehousing and data mining, spatial and temporal databases, multimedia databases, advanced transaction processing, information retrieval and database security.

**Prerequisite(s):** CIS 556

**Restriction(s):**
Can enroll if College is Engineering and Computer Science

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**CIS 587  Computer Game Design and Impl  3 Credit Hours**
This course deals with the study of the technology, science, and art involved in the creation of computer games. The focus of the course will be hands-on development of computer games. Students will study a variety of software technologies relevant to computer game design, including: programming languages, scripting languages, operating systems, file systems, networks, simulation engines, and multi-media design systems. Lecture and discussion topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, real-time processing, game theory, software engineering, human computer interaction, graphic design, and game aesthetics. (YR)

**Prerequisite(s):** CIS 553*

**Restriction(s):**
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Engineering and Computer Science
CIS 588  Computer Game Design II  3 Credit Hours
This course is a continuation of the material studied in CIS 587. The focus of the course will be hands-on development of computer game development tools (e.g. game engines). Students will study a variety of software technologies relevant to computer game design, including: 3D graphics, computer animation, data-driven game design, multiplayer game programming, and game AI. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, game theory, software engineering, human computer interaction, and game content development, and game aesthetics.
Prerequisite(s): CIS 587
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Software Engineering, Computer & Information Science

CIS 590  Selected Topics  1 to 3 Credit Hours
In-depth study of a CIS topic of contemporary interest. Topic varies from semester to semester.
Restriction(s):
Can enroll if Class is Graduate

CIS 590I  Select Topics in CIS  3 Credit Hours
Topic: Large Scale Enterprise Computing. This course helps students gain an understanding of the reasons companies chose large scale systems to run (and grow) their computing environments. Topics include capacity, scalability, integrity and security, availability, access to large amounts of data, systems management, and autonomic capabilities. Large scale enterprise computing technologies power all 50 of the top 50 worldwide banks and 22 of the top 25 U.S. retailers. The course provides a broad understanding of networking principles and the hardware and software components necessary to allow large scale systems to participate in a high volume data communications network. It discusses security principles and the hardware and software components needed to insure that the large scale systems resources and environment are secure.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

CIS 591  Directed Research Project  1 to 3 Credit Hours
Special projects for laboratory or library investigation with the intent of developing initiative and resourcefulness. The student will submit a report of the project and give an oral presentation to a panel of faculty members at the close of the term.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

CIS 592  Res Adv Cmp Net Sec  3 Credit Hours
An in-depth study of the current state-of-the-art in computer and network security. Selected topics will be from areas such as social network security, sensor network security, information and network provenance, cyber-physical system security, pervasive and mobile computing security, smart-grid security, and healthcare system security and privacy.
Prerequisite(s): CIS 584
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 647  Rsrch Advances Ntwkng&Dst Sys  3 Credit Hours
This course presents an in-depth study of such topics as Internet analysis, approaches for network performance enhancements, multimedia applications, network coding, routing techniques, congestion control, wireless and sensor networks, vehicular networks, social networks, network science, and other emerging networking technologies and applications.
Prerequisite(s): CIS 537
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 652  Info Visualztn & Comp Anim  3 Credit Hours
This course introduces algorithms for three-dimensional imaging, geometric modeling, geometric processing, information visualization, and computer animation. Particular research topics include volume graphics, point-based graphics, surface reconstruction, wavelet and subdivision methods, level of details, and physics-based animation. Students will study state-of-the-art papers in the above areas and be involved in a course project.
Prerequisite(s): CIS 551
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 658  Research Advances in Data Mgt  3 Credit Hours
An in-depth study of special topics of current interest in database systems. Selected topics will be from areas such as query optimization for emerging database systems, indexing for non-traditional data, data provenance for scientific databases, databases on modern hardware, self-managing databases, information integration and retrieval, bioinformatics, or other emerging database areas/applications.
Prerequisite(s): CIS 586
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 676  Soft Arch Des & Analysis  3 Credit Hours
This course provides in-depth coverage of the concepts needed to effectively design and analyze software architectures. It introduces major architectural styles and design patterns and illustrates their application in designing and analyzing modern software architectures such as wireless, service-oriented, and security-based systems. The course also studies software architecture documentation practices that meet the needs of the entire architecture stakeholder community.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

CIS 678  Research Advances Software Eng  3 Credit Hours
An in-depth study of the current state-of-the-art in software engineering. Selected topics will be from areas such as software maintenance, software testing, model-driven engineering, human factors in software engineering, software specifications, software management, emerging technology and applications, applying optimization techniques in software engineering, and empirical software engineering.
Prerequisite(s): CIS 565
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
CIS 679  Computational Game Theory  3 Credit Hours
This course will introduce students to fundamental concepts and results in the area of computational game theory and economics, and expose them to the state-of-the-art and applications, providing them with the ability to make significant contributions to this quickly developing research area. This emerging area is at the interface of computer science and economics and seeks to build on classical results in game theory to provide practical models and effective algorithms better suited to study and solve problems in large complex systems in modern society. Of major interest are compact models and efficient algorithms to understand and predict the complex global behavior that emerges from local interactions. Auctions, the Internet, social networks, computational biology, and interdependent security are some example application domains. (F).
Prerequisite(s): CIS 579
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or

CIS 685  Res Adv in Art Intell  3 Credit Hours
Full Course Title: Research Advances in Artificial Intelligence. An in-depth study of the current state-of-the-art in artificial intelligence. Selected topics will be from areas such as analytics, advanced neural nets and deep learning, multi-agent systems, auctions, cooperation, competition, genetic algorithms and evolutionary computing, swarm intelligence, game-theoretic approaches to decision and policy making, advanced techniques for natural language processing, and advanced techniques in knowledge discovery. (F)
Prerequisite(s): CIS 585
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or
Can enroll if College is Engineering and Computer Science

CIS 691  Adv Dir Study  1 to 3 Credit Hours
Advanced Directed Studies: Special topic in computer and information science. A project report and a seminar are required.
Restriction(s):
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science

CIS 695  Master's Project  3 Credit Hours
Application of the methodologies, tools and theory of software engineering to produce a specific validated software product. Projects can be faculty-generated, self-generated, and/or work related. All projects must be undertaken with one or more students under the supervision of the instructor. Prior to enrollment, a project proposal must be prepared and approved by the instructor and department chair. Standard software engineering documents must be prepared and approved at each phase of the project, and an oral presentation of the project is required. Course includes lectures and case studies. Permission of instructor required.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Program is MS-Software Engineering, MS-Computer & Information Sci

CIS 699  Master's Thesis  1 to 6 Credit Hours
Graduate students electing this course, while working under the general supervision of a member of the department faculty, are expected to plan and carry out the work themselves and submit a thesis for review and approval, and also present an oral defense of the thesis.
Restriction(s):
Can enroll if Class is Graduate

CIS 791  Adv Guided Study  2 to 6 Credit Hours
This is a guided study course for doctoral students on an advanced topic of research. A report and an oral presentation are required.
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science

CIS 798  Doctoral Seminar  0 Credit Hours
After attaining candidacy, every Ph.D. student is required to attend and actively participate in seminars each semester until graduation. In addition, each Ph.D. student is required to present a one-hour seminar about his/her research on a pre-assigned research topic, as well as lead a follow-up discussion on the future trends in his/her field. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is Computer & Information Science

CIS 980  Pre-Cand Dissertation Research  1 to 9 Credit Hours
Dissertation work by a pre-candidate student in Computer and Information Sciences program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate
Can enroll if Major is Computer & Information Science

CIS 990  Doctoral Dissertation  1 to 9 Credit Hours
Dissertation work by a student of the Ph.D. in Computer and Information Science program, conducted under guidance of the faculty advisor. The student must be a Ph.D. candidate. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is Computer & Information Science

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Computer Engineering
The ECE Department offers, an evening program of 30 credit hours, leading to the degree of Master of Science in Engineering (Computer Engineering). Students desiring admission to the program must have earned a Bachelor's degree in Electrical and/or Computer Engineering with an overall GPA of 3.0 or higher. Students whose undergraduate background is in a field other than Electrical or Computer Engineering may be given conditional admission and required to take preparatory courses in electrical and/or computer engineering. Students admitted to the program are required to take courses as specified below. Students are expected earn a B or better in every graduate course to be credited toward the degree requirements, however, a maximum of two grades of B- will be accepted. In addition, students must maintain a cumulative GPA of 3.0 or higher in every semester. Students may be placed on probation if their cumulative GPA falls below 3.0. Finally, a cumulative GPA of 3.0 or higher is required in order to be eligible to receive the MSE (CE) degree.

Specific course requirements are described next.
This degree program is available both on campus and online.
### Specific Course Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>Core Courses</strong></td>
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<td><strong>Required:</strong></td>
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<td>ECE 554</td>
<td>Embedded Systems</td>
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<td>Two Courses from the following list:</td>
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<tr>
<td>ECE 570</td>
<td>Computer Networks</td>
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<td>ECE 575</td>
<td>Computer Architecture</td>
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<td>ECE 5752</td>
<td>Reconfigurable Computing</td>
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<tr>
<td>ECE 578</td>
<td>Advanced Operating Systems</td>
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<td><strong>Concentration Courses</strong></td>
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<td>Select three courses from one or more of the concentrations areas:</td>
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<td>Computer Architecture and Design:</td>
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<td>ECE 514</td>
<td>VLSI Design</td>
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<td>ECE 528</td>
<td>Cloud Computing</td>
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<td>ECE 5542</td>
<td>Embedded Sig Proc and Control</td>
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<td>ECE 574</td>
<td>Adv Sftwr Techq in Eng Appl</td>
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<td>ECE 575</td>
<td>Computer Architecture</td>
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<td>ECE 5752</td>
<td>Reconfigurable Computing</td>
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<td>ECE 675</td>
<td>Computer Architecture II</td>
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<td>Networks and Communications:</td>
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<td>ECE 526</td>
<td>Multimedia Comm Sys</td>
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<td>ECE 535</td>
<td>Mob Dev &amp; Ubiqys Comp Sys</td>
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<td>ECE 550</td>
<td>Communication Theory</td>
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<td>ECE 5541</td>
<td>Embedded Networks</td>
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<td>Computer Networks</td>
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<td>ECE 5701</td>
<td>Intro to Wireless Comm</td>
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<td>ECE 5702</td>
<td>High-Speed and Adv Networks</td>
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<td>Intelligent Systems:</td>
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<td>ECE 531</td>
<td>Intelligent Vehicle Systems</td>
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<td>ECE 537</td>
<td>Data Mining</td>
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<td>ECE 552</td>
<td>Fuzzy Systems</td>
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<td>ECE 579</td>
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<td>ECE 5831</td>
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<td>Multimedia Engineering:</td>
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<td>ECE 525</td>
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<td>ECE 5251</td>
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<td>ECE 5252</td>
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<td>Information Engineering</td>
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### Professional Electives

Students may complete the professional elective in several ways: (1) Elect the thesis ECE 699 (6 hours) to work under the supervision of a faculty advisor, (2) Take direct study by ECE 591 (3 credits), and one CE course from the lists above, (3) take two CE courses from the lists above.

### Cognate Courses

Students should select a minimum of 4 and a maximum of 6 credit hours of courses from other disciplines. Some courses from outside ECE may not meet cognate requirement. Please check with the ECE Department prior to registering.

### Preparatory Courses

Students with inadequate background in Electrical or Computer Engineering may be required to meet with the department graduate advisor to determine the need for preparatory courses.

For further information please contact:

Department of Electrical and Computer Engineering  
University of Michigan-Dearborn,  
4901 Evergreen Road  
Room 206 ELB, Dearborn, MI 48128-2406  
Tel: 313-593-5420 Fax: 313-583-6336  
E-mail: umd-ecegrad@umich.edu

ECE 500 Math Mthds for Elec & Comp Eng 3 Credit Hours  
Topics include: Transform Techniques using Fourier series, Fourier transforms, Laplace transforms and Sampling Theorem. Linear Algebra using eigen expansions, polynomial functions and matrices and determinants. Random Variables using probability density and distribution functions, functions of a random variable, and conditional and joint probabilities.

Restriction(s):  
Can enroll if Class is Graduate  
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 5001 Analytic and Comp Math 3 Credit Hours  
Full Title: Analytical and Computational Mathematics This course covers selected topics in applied mathematics useful in science and engineering fields, including: solution of linear equations, polynomial interpolation and approximation, solution of nonlinear equations, roots of polynomials, resultants, approximation by orthogonal functions (includes Fourier series), ordinary differential equations, optimization, calculus of variations, probability and stochastic processes, computational geometry, and differential geometry. In addition to providing students with necessary mathematical knowledge for their future course study and research projects, students will be required to program in MATLAB and/or other languages to gain and improve programming ability. Students in RE program must take this course in the first year. This course cannot be taken with ECE 500. Three lecture hours per week. (F)

Restriction(s):  
Can enroll if College is Engineering and Computer Science

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1. These are partial lists and will be expanded and updated from time to time.
ECE 502 Electromag Theory & Simul  3 Credit Hours
The course will cover basic devices and applications in Electromagnetic waves. The course will use examples of electromagnetic devices that operate at low frequency, (e.g., coils and motors), and others that operate at high frequency (e.g., Optical fiber, Laser, Imaging Sensor, LEDs, Solar cells and Antenna.) The course will develop fundamental understandings for the behavior of these devices. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer Engineering, Electrical Engineering

ECE 505 Intro to Embedded Systems  3 Credit Hours
Introduction to modern digital computer logic. Numbers and coding systems; Boolean algebra with application to logic systems; examples of digital logic circuits; simple machine language programming and Assembly and C/C+ programming language; microprocessors programming (both assembly and C/C+) for input/output, interrupts, and system design. (May not be available to students with EE or CE degrees) Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 507 Intro to Multimedia Sys  3 Credit Hours
This course is designed to provide a broad overview of the engineering, art, and business of developing multimedia systems. In terms of technical and engineering issues, students will learn basic data analysis techniques and computer programming tools. In terms of art and media, students will learn the basics of human perception, communication, and aesthetics. In terms of business, students will learn how to identify customer needs and think like an entrepreneur. By learning and understanding the working vocabulary of each of these three fields, students will be able to contribute creative and effective multimedia-based solutions to interesting real-world problems. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 510 Vehicle Electronics I  3 Credit Hours
This course discusses the principles of electrical engineering and applications of electrical and electronic systems in automobiles, including resistive, inductive, and capacitive circuit analysis, semiconductor diodes, junction transistors, FETS, rectifiers, and power supplies, small signal amplifiers, biasing considerations, gain-bandwidth limitations, circuit models. Some automotive EE applications are used for case study. Three lecture hours per week. (Not open to students with EE degree.)
Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 512 Analog Filter Design  3 Credit Hours
This course addresses the analysis and design of continuous time (analog) and switched-capacitor filters. Students will analyze and design filters. Effect of tolerances of circuit elements on the performance of the circuit behavior will be analyzed. Students will use simulation tools to design filters and verify circuit performance. Three lecture hours per week.
Prerequisite(s): ECE 314
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 513 Computer-Aided Network Design  3 Credit Hours
Numerical methods required for circuit analysis and design using digital computers are investigated. These techniques include matrix analysis of linear systems; network graphic theory, tolerance analysis, transient analysis, numerical integration, nonlinear circuit analysis, network optimization, and device modeling. Practical examples are given requiring the construction of computer subroutines and use of general analysis programs such as ECAP and CIRAN. Three lecture hours.
Prerequisite(s): ECE 410
Restriction(s):
Can enroll if Class is Graduate

ECE 514 VLSI Design  3 Credit Hours
Topics relevant to the design and analysis of VLSI circuits are investigated. These include an introduction to CMOS circuits, their characterization and performance estimation. Logic design and testing of VLSI circuits. Analysis of layout and the design of subsystems. VHDL and commercial CAD packages for VLSI design.
Prerequisite(s): ECE 413
Restriction(s):
Can enroll if Class is Graduate

ECE 515 Vehicle Electronics II  3 Credit Hours
This course discusses advanced topics in electronics with an emphasis on vehicle applications. It will include ignition systems and controls, amplifiers, frequency characteristics of electronic circuits, feedback in electronic systems and stability, power electronics and motor drive controls (DC/DC and DC/AC converters) and EMC issues. Selected examples include applications such as voltage regulators and battery chargers. Three lecture hours per week.
Prerequisite(s): AENG 510

ECE 516 Electronic Materials & IC Proc  3 Credit Hours
Prerequisite(s): AENG 510

ECE 517 Vehicle Electronics III  3 Credit Hours
This course covers advanced topics in vehicle electronics, including sensor systems, microprocessor applications, and motor drive control systems. It will cover topics such as signal processing, fault detection, and diagnostic strategies. Three lecture hours per week.
Prerequisite(s): ECE 515
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering
ECE 517    Adv Pwr Electrncs&Motor Drvs   3 Credit Hours
This is an advanced course on power electronics and electric drives. Example topics include DC, induction, synchronous and reluctance drives; industrial and residential application of power electronics; practical aspects of design of power electronics devices including heat sink and magnetic components designs. Three lecture hours per week.
Prerequisite(s): ECE 415
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 518    Mat Selecs for Commercial Prod   3 Credit Hours
Impact of modern materials on commercial product performance; representative illustrations from product areas such as automotive vehicles, commercial aircraft, recreational equipment, and electronic products.
Restriction(s):
Can enroll if Class is Graduate

ECE 519    Adv Topics in EMC   3 Credit Hours
This course covers the EMC requirements and EMC test methods for large systems. Examples involving various types of applications (automotive, communications, computers) will be discussed. Discussion of design practices used in large installation, including component segregation, cable routing, connectors, grounding, shielding, common impedance coupling, ground planes, screening and suppression. Classification of electromagnetic environments will also be discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 524    Interactive Media   3 Credit Hours
This course will provide an introduction to computer and human interface and AI, user-interface design from design principles and cognitive perspectives. The course covers such topics innovative multimedia interfaces, design ethics, psychological principles, cognitive models, interaction principles, requirements analysis, project management, I/O devices, standards and styles guides, and visual design principles. This is a project-based class. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

ECE 525    Multimedia Data Stor & Retr   3 Credit Hours
This course will cover the fundamental concepts and techniques used in multimedia data, storage and retrieval including storage and retrieval images, videos, audio and text documents. Selected multimedia applications will be discussed and students will be required to work on a project related to multimedia applications such as advertising and marketing, education and training, entertainment, medicine, surveillance, wearable computing, biometrics, and remote sensing. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5251   MM Design Tools I   3 Credit Hours
This course will introduce students to design tools for multimedia systems. Basic concepts, algorithms, and standards will be covered for systems that process digital images, vector graphics, and text. Models and relevant parameters of display technologies (video and printer) will be discussed. Part of the coursework involves a project concerning the analysis and design of a multimedia-based system. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 526    Multimedia Comm Sys   3 Credit Hours
Object of this course is to introduce current techniques in multimedia communications. This course will cover in-depth study of existing multimedia compression standards such as, MPEG, MJEG, JPEG2000, etc. The course will introduce the basic issues in multimedia communications and networking and is designed to give the student hands-on experience in various aspects of multimedia communications through the various assignments and projects.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 527    Multimedia Secur & Forensics   3 Credit Hours
Object of this course is to introduce current techniques information security in general and multimedia security in particular. This course will cover existing information hiding techniques such as digital watermarking, steganography, and fingerprinting. The course will also cover basics of cryptography and coding theory. This course will cover the basic issues in multimedia security and forensics and is designed to give the student hands-on experience in various aspects of information security and forensic analysis through the various assignments and projects. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 528  Cloud Computing  3 Credit Hours
Cloud computing represents the emerging Internet-based services/platforms with elastic and scalable computation powers operating at costs associated with service. Topics of the course include advanced web technologies, distributed computing models and technologies, software as a service (SaaS), virtualization, pallelization, security/privacy and the advance in cloud computing. Course work includes building up a SaaS project. Students cannot take both ECE 428 and ECE 528 for degree credit. Three lecture hours per week.
Restriction(s):
Cannot enroll if Class is
Can enroll if Level is Graduate or Doctorate
Cannot enroll if Major is

ECE 529  Intro to Computer Music  3 Credit Hours
This course will introduce students to methods and technologies of computer music. The basics of digital audio will be covered, including sampling, quantization, and compression standards. Various analysis tools will be covered, including the Fourier transform and windowing techniques. Mathematical models of physical instruments will be introduced. Various sound synthesis strategies will be introduced: wave tables, additive synthesis, subtractive synthesis, frequency modulation, and granular synthesis. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 530  Energy Storage Systems  3 Credit Hours
This course introduces the basics of energy storage systems for EDV. It will cover battery basics, ultracapacitors, flywheels, and hybrid energy storage concepts. Battery management, battery charging, and battery safety will be covered. Finally, the requirements of EDV and renewable energy application examples will be explained. Lead acid, nickel metal hydride, and lithium ion batteries will be covered. Other energy storage systems such as super conducting magnetic, hydraulic, compressed air, and integrated (hybrid) energy storage systems, will be discussed as well.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 531  Intelligent Vehicle Systems  3 Credit Hours
The course covers important technologies relevant to intelligent vehicle systems including systems architecture, in-vehicle electronic sensors, traffic modeling and simulation. Students will design and implement algorithms and simulate driver-highway interactions.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Cannot enroll if Major is

ECE 532  Auto Sensors and Actuators  3 Credit Hours
Study of automotive sensory requirements; types of sensors; available sensors and future needs. Study of functions and types of actuators in automotive systems. Dynamic models of sensors and actuators. Integrated smart sensors and actuators. Term project.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 533  Active Automotive Safety Sys  3 Credit Hours
The course addresses enabling technologies relevant to active automotive safety systems. The study of intelligent vehicle systems includes system architectures, sensors, and algorithms. Modeling and simulation will also be covered. Students will design and simulate systems encompassing important concepts presented in the course. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 535  Mob Dev & Ubiqys Comp Sys  3 Credit Hours
This class will introduce students to the technology used in mobile/ smart devices and mobile communication networks. Various hardware and software aspects will be introduced, with particular emphasis on the constraints intrinsic to such system. Students will get an overview of various mobile operating systems and will learn how to develop software for mobile devices. The topics of ubiquitous and pervasive computing will be introduced and discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is

ECE 536  All Weather Automotive Vision  3 Credit Hours
Coverage of the next generation of active automotive safety systems including intelligent cruise control, lane departure warning, virtual camber, and back-up and blind spot warning systems. Topics include active safety system architecture, enabling technologies for such systems, and future directions. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 537  Data Mining  3 Credit Hours
Introduction to the fundamental concepts of data mining including data exploration, pre-and post-processing, OLAP, predictive modeling, association analysis, and clustering. This course also focuses on the analysis of algorithms commonly used for data mining applications, mining structured, semi-structured and unstructured data, stream data, and web data. Team oriented course project to provide hands-on experience may be required. Three lecture hours per week.
Prerequisite(s): ECE 479 or CIS 479
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 539  Production of Elec Prods  3 Credit Hours
The course discussed the manufacturing of discrete components, integrated circuits, hybrid circuits and modules, advances packages, printed circuit boards, optical components, and MEMS products. Special topics on product testing, reliability assurance, accelerated reliability testing, product lifetime models, and automotive environments will also be addressed. The course will be organized as a combination of conventional lectures, workshops-style discussion, and design review sessions. Three lecture hours per week.
Restriction(s):
Can enroll if Major is Electrical Engineering, Manufacturing Engineering, Computer Engineering

ECE 541  Intro to Electrical Energy Sys  3 Credit Hours
The course will cover the sources of energy including coal, nuclear, solar, wind; their impact on the climate; and their technological characteristics in terms of availability, cost and reliability. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Mechanical Engineering, Industrial & Systems Engin, Computer Engineering, Electrical Engineering
ECE 542 Intro to Pwr Mgmt & Reliability 3 Credit Hours
This course will give students an introduction to power and energy management systems. Students will be exposed to a broad range of topics including optimal power flow, Smart Grid technology, economic dispatch, unit commitment, and the impact of renewable energy on power and management systems. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 543 Kinem, Dynm Control Robots 3 Credit Hours
Full Title: Kinematics, Dynamics, and Control of Robots
This course provides a systematic study of robotics, covering various topics in kinematics, dynamics, control, and planning for robot systems. The purpose of this course is to let students get familiar with the traditional mathematical description of a robotic system and understand fundamental concepts and principles in robotics, to enable students to derive equations of motion for robotic systems, analyze their kinematic and dynamic properties, and design control strategies, and also to have students gain knowledge and experience about commonly-used robotic systems and mechanisms. Starting with rigid body motion, we will learn a systematic way to describe a robot system that consists of multiple links connected through different kinds of joints. Kinematics will include forward and inverse kinematics and their analytical and computational techniques. Control will include the classic PID control, position and force control, and trajectory planning. This course will also discuss some specific topics in robotics research, including robot manipulators, mobile and walking robots, and robot hands, in which we will see how the above principles and methods are being used together. Three lecture hours per week. (W)
Prerequisite(s): ECE 347
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science

ECE 544 Mobile Robots 3 Credit Hours
This course gives an introduction to all the fundamentals of mobile robots, ranging from theory, such as kinematics, over hardware, such as sensors and motors, to core algorithms for sensory information processing, motion planning and control, and design control strategies. For each subsystem, the discussion includes relevant methods for understanding and constructing the model of the environment or controlling the motion of the robot. The course has three lecture hours per week. Students are expected to have knowledge of MATLAB or C/C++ programming and will be required to accomplish a course-related project. Three lecture hours per week. (F)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science

ECE 545 Intro Robot Syst 3 Credit Hours
Full Title: Introduction to Robotic Systems
This course introduces basic components of robotic systems, selection of coordinate frames, homogeneous transformations, solutions to kinematics of manipulators, velocity and force/torque relations, dynamic equations using Euler-Lagrange formulation, obstacle avoidance and motion planning, classical controllers for manipulators and control design using torque method, and robot simulation tools. Sensing technologies including basic computer vision will be covered. Robot simulation technologies and tools will be introduced. Robotic systems other than manipulators will be introduced at the end of this course. Three lecture hours per week. (F)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 546 Electric Vehicles 3 Credit Hours
To introduce fundamental concepts and specifications of electric and hybrid vehicles; vehicle design fundamentals; motors for electric vehicles; controllers and power electronics; energy sources; engineering impact of electric vehicles and practical design considerations. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 5462 Elec Aspects of Hybrid Vehicle 3 Credit Hours
To introduce fundamental concepts and the electrical aspects of HEV, including the design, control, modeling, battery and other energy storage devices, and electric propulsion systems. It covers vehicle dynamics, energy sources, electric propulsion systems, regenerative braking, parallel and series HEV design, practical design considerations, and specifications of hybrid vehicles. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 550 Communication Theory 3 Credit Hours
The basic limitations and alternatives for communications signaling are studied, using appropriate mathematical tools. The topics include: review of information measure; random process and vector description of signals and noise; optimum receiver principles; signaling alternatives; channel capacity; block and convolutional coding; waveform estimation concepts. Practical system examples are stressed.
Prerequisite(s): ECE 450
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 552 Fuzzy Systems 3 Credit Hours
A study of the concept of fuzzy set theory including operations on fuzzy sets, fuzzy relations, fuzzy measures, fuzzy logic, with an emphasis on engineering application. Topics include fuzzy set theory, applications to image processing, pattern recognition, artificial intelligence, computer hardware design, and control systems.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 553 Software/Hrdware Rapid Protyp 3 Credit Hours
Rapid prototyping technology is primarily aimed at reducing the lead times and costs associated with new product development. Rapid prototyping requires a good quality 3D CAD system. This course will cover the software and hardware widely used in the rapid prototyping, including Stereolithography (SLA) and virtual reality software and hardware used for rapid prototyping. (YR)
Restriction(s):
Can enroll if Class is Graduate
ECE 554  Embedded Systems  3 Credit Hours
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5541 Embedded Networks  3 Credit Hours
Embedded network systems merge modern communications, networks, sensing, distributed control and mobile computing enabling novel applications in a broad area of control, automation, and distributed real time systems. The course will focus on vehicular communications and networking, autonomous vehicles and intelligent transportation systems, robotics networks, and smart grids. Topics include: an overview of embedded processors and microcontrollers, digital signal processors, field programmable gate arrays (FPGAs), sensors and actuators, embedded operating systems including various Linux and Android platforms, and embedded networks. Students will be exposed to advanced system design methods, modeling, simulation, and system verification and evaluation. A term project may be required. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Specialist or Graduate or or Doctorate

ECE 5542 Embedded Sig Proc and Control  3 Credit Hours
This course bridges the gap between embedded software engineering principles and theoretical signal processing and control concepts. Topics include a survey of embedded software architectures, real-time principles and concerns, sensor and actuator interfacing, PIO feedback control systems, Audio/time-series filtering (FIR and IIR filters), embedded image processing, automatic code generation from higher level modeling languages such as MATLAB and Simulink, and working with single-board computers and digital signal processors (DSP). It is a project oriented course, with hands-on assignments, group projects and an individual research component. (F)
Prerequisite(s): ECE 473 or ECE 4951 or ECE 554
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 5543 Embedded System Security  3 Credit Hours
This course introduces fundamental concepts of information security and threat models. In depth study of the principles, algorithms, techniques, protocols and applications of embedded security, including secure software development, light weight cryptographic algorithms, information security protocols for embedded applications, tamper detection, automotive security, embedded network transactions, and other emerging embedded applications in the areas of IoT and cyber-physical systems will be covered. (W,YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 5544 Intro. to CPS Security  3 Credit Hours
This course covers introductory topics in cyber-physical systems (CPSs) security. This course is intended to expose students to fundamentals of security primitives specific to CPSs and to apply them to a broad range of current and future security challenges that such systems are facing. Much of the course addresses Industrial Control Systems and smart grids. However, students will be expected to generalize the concepts for other CPSs. Students will work with various tools and techniques used by hackers to compromise computer systems or otherwise interfere with normal operations. Students will also use tools that are unique to interacting with cyber-physical systems. The purpose of this course is NOT to teach students how to become hackers, but rather to teach them about threat models and attack vectors for cyber-physical systems so that they can develop countermeasures to defend against threats. (YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 5545 Sec. & Privacy for Smart Grids  3 Credit Hours
Full Course Title: Security and Privacy for Smart Grids The goal of this course is to provide a comprehensive understanding of the challenges, issues, solutions, and state-of-the-art research and best practices pertaining to the cyber-security of the modern power grids, also known as "smart power grids". The course is intended to provide an overview of information security, CPS security, risk assessment and mitigation, network security, attack-resiliency for bulk power systems, attack surface analysis and reduction techniques, cyber-security testbeds, security standards and best practices for critical infrastructure, e.g., smart power grids. This course will build the skills needed to design and test the protocols, policies, and specifications for enabling technologies that will guarantee the security and integrity of the smart power grid while preserving personal privacy. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 555 Stochastic Processes  3 Credit Hours
Review of probability and random variables. Introduction to stochastic processes; stationarity, ergodicity; auto correlation and cross correlation, linear systems with random inputs, spectral analysis, Wiener filtering, Kalman filtering. Applications to smoothing, parameters estimation, prediction, system identification.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 560 Modern Control Theory  3 Credit Hours
Introduction to linear spaces and operators; mathematical description of multiple input-output systems; state variables and state transition matrix; controllability and observability and its application to irreducible realization of transfer function matrices; state variable estimation; controller synthesis by state feedback; stability of linear systems; analysis of composite systems.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 565 Digital Control Systems  3 Credit Hours
Mathematical representation of digital control systems; z-transform and difference equations; classical and state space methods of analysis and design; direct digital control of industrial processes.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Class is Graduate or Doctorate
ECE 566  Mechatronics  3 Credit Hours
Mechatronics, as an engineering discipline, is the synergistic combination of mechanical engineering, electrical engineering, control engineering, and computer science, all integrated through the design process. The course is to establish a working familiarity with the key engineering elements in the design and control of electro-mechanical systems in general and automotive systems in particular. The key engineering elements include microprocessor technology, electronics, sensors and actuators, data communication and interface, control algorithms, and mechanisms of machine elements. The course is to introduce a design methodology in an integrated system environment through case studies and design projects. (AY).
Prerequisite(s): ME 442 or ECE 365
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 567  Nonlinear Control Systems  3 Credit Hours
Nonlinearities in control systems; phase plane analysis; isolines, equilibrium points, limit cycles, optimum systems; heuristic methods; harmonic balance, describing function, frequency response and jump phenomena, oscillations in relay systems; state space; optimum relay controls; stability; Liapunov's method.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 569  Computer-Based Automation  3 Credit Hours
Prerequisite(s): ME 588 or ECE 539
Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 570  Computer Networks  3 Credit Hours
A study of data communications and network architecture fundamentals. Topics include signals and data transmission, modulation, encoding, and public carriers and network architectures; data link network layer, and transport layer protocols; case studies of existing and emerging networks; wireless, embedded, and conventional wired systems. Three lectures hours per week.
Prerequisite(s): ECE 471
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 5702  High-Speed and Adv Networks  3 Credit Hours
The course introduces concepts in protocols and architecture of high-speed and advanced networks with an emphasis on Internet, ATM networks, wireless local area networks, cellular systems and wireless sensor networks. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 571  Switching Theory  3 Credit Hours
Combinational and sequential logic design, minimization of combinational and sequential circuits, functional decomposition, reliable design and fault diagnosis; incompletely specified sequential machine design, asynchronous sequential circuits and interactive methods.
Prerequisite(s): ECE 273
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 572  Sequential Machines  3 Credit Hours
Prerequisite(s): ECE 571
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 574  Adv Sftwr Technq in Eng Appl  3 Credit Hours
Topics relating to Software Development for engineering applications will be discussed. These may include data structures, algorithm complexity, personal software development process, team software process, Six sigma, DFSS, software techniques, software engineering application, and software design. Three lecture hours per week.
Prerequisite(s): ECE 474
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 575  Computer Architecture  3 Credit Hours
This course addresses the basics of computer architecture including central processing architecture, instruction set design, input/output and RAID, main memory, Cache, and virtual memory. Three lecture hours per week.
Prerequisite(s): ECE 375
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 5752  Reconfigurable Computing  3 Credit Hours
This course addresses advances in reconfigurable computing techniques, design, and research. The course topics include introduction to RC, Hardware Description Language (HDL) such as VHDL and Verilog HDL, System-On-Chip (SOC), and Network-On-Chip (NOC). Three lecture hours per week.
Prerequisite(s): ECE 475
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
**ECE 576 Information Engineering 3 Credit Hours**
This course will cover fundamental concepts of information engineering, including theoretical concepts of how information is measured and transmitted, how information is structured and stored, how information can be compressed and decompressed, and information networks such as social networks, affiliation networks and online networks, mathematical theories of information networks. Information engineering applications will be discussed. Three lecture hours per week.

**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

**ECE 577 Engineering in Virtual World 3 Credit Hours**
An in-depth study of selected topics in design and development of virtual systems in industrial environments. Topics include cyberspaces, techniques for generating virtual worlds in engineering applications, building blocks of virtual environments including hardware and software. Case studies.

**Prerequisite(s):** ECE 273 and ECE 371

**Restriction(s):**
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

**ECE 5770 Autonomous UAS 3 Credit Hours**
This course will introduce the basic concepts of autonomous unmanned aerial systems. Topics will include basic flight principles of fixed-wing and rotary-wing aircraft, inertial representations in 3D space, the principles of Bayesian state estimation, visual odometry, path planning, and autonomous navigation. This course will also cover aircraft actuation, sensors and perception (GPS, inertial measurements, ranging, and basic computer vision), sensor fusion technique, and motion control of unmanned aircraft. Students are expected to have knowledge of high-level programming language and will be required to accomplish a course project. Three lecture hours per week. (W)

**Prerequisite(s):** ECE 347 or IMSE 317

**Restriction(s):**
Can enroll if College is Engineering and Computer Science

**ECE 578 Advanced Operating Systems 3 Credit Hours**
Advanced techniques and uses in operating system design. Distributed operating systems. Message-based operating systems. Operating systems for parallel architectures. Layered techniques in operating systems. Formal models of operating systems. Current trends in operating system design.

**Prerequisite(s):** ECE 478 or CIS 450 or IMSE 450

**ECE 579 Intelligent Systems 3 Credit Hours**
Representative topics include: Intelligent systems design, training and evaluation, decision trees, Bayesian learning, reinforcement learning. A project will be required.

**Prerequisite(s):** ECE 479

**Restriction(s):**
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

**ECE 5791 Vehicle Power Management 3 Credit Hours**
This course provides graduate students with a clear understanding of the latest vehicle power management technologies with an emphasis on alternative fuel vehicles. The course will cover topics such as electrified powertrain configurations. Vehicle power management basic concepts, vehicle propulsion system modeling, vehicle power management approaches (analytical approach, wavelet transform technology, DP&QP and intelligent systems methods). ESS (especially batter) management, power electronics in HESS and motor drive, HEV component optimization, HIL and SIL, vehicle power management future trends, and so on. Three lecture hours per week.

**Restriction(s):**
Can enroll if Class is Graduate or Doctorate

**ECE 580 Digital Signal Processing 3 Credit Hours**
This course addresses the analysis and design of discrete time signals and systems. Students will become familiar with the mathematical tools needed for digital signal processing such as the Fourier transform, frequency response, the sampling theorem, and z-transform method. Topics covered will also include the design of digital filters (IIR and FIR filters), characteristics of analog-to-digital and digital-to-analog converters, the spectral analysis of signals, and discrete filters. Three lecture hours per week.

**Prerequisite(s):** ECE 300

**Restriction(s):**
Can enroll if Class is Graduate or Doctorate

**ECE 5802 Multirate Sig Proc w/App 3 Credit Hours**
This course provides an introduction to multirate digital signal processing with application in different fields of engineering, with a focus on the presentation of the theoretical foundation for all aspects of multirate digital signal processing. The course examines modern applications of multirate digital signal processing including the design of multirate filter banks, using the wavelets transforms to efficiently encode signals for compression purposes, spectral analysis and synthesis of signals. Students will apply software tools to analyze, design and simulate multirate digital signal processing systems. Three lecture hours per week.

**Prerequisite(s):** ECE 580

**Restriction(s):**
Can enroll if Level is Rackham or Graduate or Doctorate

**ECE 581 Arch for Digital Signal Proc 3 Credit Hours**
This course introduces the architectural fundamentals and features of programmable digital signal processors. Numeric representations and arithmetic concepts are discussed, which include fixed-point and floating-point representation of numbers, native data word width, and IEE-754 floating-point representation. Memory architecture and memory structures of digital signal processors are examined. Programming concepts for DSP processors such as addressing, instruction set, execution control, pipelining, parallel processing and peripherals are discussed. Finally, students will work on related applications employing digital signal processors such as speech processing, instrumentation, and image processing. Three lecture hours per week.

**Prerequisite(s):** ECE 580

**Restriction(s):**
Can enroll if Class is Graduate
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science
ECE 582  Intro to Statistical DSP  3 Credit Hours
Review of discrete-time signals and systems, introduction of discrete-time random signals and variables, linear signal models, nonparametric power spectrum estimation, least-squares filtering and prediction, signal modeling and parametric spectral estimation, selected topics. (W).
Prerequisite(s): ECE 580*
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering

ECE 583  Artificial Neural Networks  3 Credit Hours
Students will gain an understanding of the language, formalism, and methods of artificial neural networks. The student will learn how to mathematically pose the machine learning problems of function approximation/supervised learning, associative memory and self-organization, and analytically derive some well-known learning rules, including backprop. The course will cover computer simulations of various neural network models and simulations. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5831  Pat Rec & Neural Netwks  3 Credit Hours
Students will gain understanding of the language, formalism, and methods of pattern recognition. Various solution approaches will be covered including statistical methods and neural network-based methods. Students will learn how to mathematically pose various pattern recognition problems and analytically derive some well-known statistical results and learning rules. In addition, the student will learn how to perform computer simulations of various statistical and neural network models, and learn how to select appropriate model parameters, such as network architecture, hidden layer size, and learning rate. Case Studies will be presented to illustrate a variety of applications.
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 584  Speech Processes  3 Credit Hours
The course introduces the fundamentals of speech processing using digital signal processing methods and techniques. How speech is produced from the human vocal system and the different types of basic speech sound components is addressed, followed by methods to analyze speech signals in both the time domain and frequency domain. Applications of speech processing are also presented. Possible applications covered include speech synthesis, speech coding and speech recognition. A team-based term project may be required. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate

ECE 585  Pattern Recognition  3 Credit Hours
Introduction to pattern recognition (PR) as a process of data analysis. Representation of features in multidimensional space as random vectors. Similarity and dissimilarity measures in feature space. Bayesian decision theory, discriminant functions and supervised learning. Clustering analysis and unsupervised learning. Estimation and learning. Feature extraction and selection. Introduction to interactive techniques in PR. Applications of PR.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 586  Digital Image Processing  3 Credit Hours
Monochrome and color vision in man and machines, image quantization edge detection, image enhancement, image restoration, color analysis and processing, multispectral image processing, texture analysis, image coding and compression, morphology, geometrical image modifications.
Prerequisite(s): ECE 450
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 587  Sel Top:Image Proc/Mach Vision  3 Credit Hours
A special topics course providing an in-depth examination of one or several areas in image processing and/or machine vision. Possible areas include medical imaging, advanced concepts in morphology, stereovision, shape form shading, and active vision.
Prerequisite(s): ECE 586
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 588  Robot Vision  3 Credit Hours
This course introduces important theory and modern technology in robot vision. Representative topics are sensors and image formation, advanced algorithms in object feature filtering, extraction and recognition, texture and colors, motion, 3D vision, and applications. Students cannot receive credit for both ECE 4881 and ECE 588. Three lecture hours per week.
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 589  Multidimen Digital Signal Proc  3 Credit Hours
Topics include multidimensional signal analysis methodologies, signal representation, 2-D FIR filter, 2-D recursive systems and IIR filters, spectral estimation and methods, multidimensional signal restoration applications in 2-D and 3-D image processing, reconstruction, and feature estimation. Three lecture hours per week.
Prerequisite(s): ECE 580

ECE 590  Selected Topics  1 to 3 Credit Hours
Individual or group study, design, or laboratory research in a field of interest to the students. Topics may be chosen from any of the areas of electrical engineering. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering
ECE 591  Directed Studies  1 to 3 Credit Hours
Special projects for laboratory or library investigation with the intent of developing initiative and resourcefulness. The student will submit a report of the project and give an oral presentation to a panel of faculty members at the close of the term.

Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 592  Directed Research  1 to 3 Credit Hours
Special problems centered on developing experimental skills. In consultation with a faculty advisor a student will prepare a proposal describing the work to be performed for approval by the department. An oral presentation and a final report on the research effort are required for completion. (F,W,S)

Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 610  Analog IC  3 Credit Hours
***NO DESCRIPTION AVAILABLE***

ECE 612  Wireless Sensor Networks  3 Credit Hours
Advanced data communications, sensor motes, systems architecture and design, wireless communications standards and protocols, routing, security, operating systems, language support, and applications. Three lecture hours per week.

Prerequisite(s): ECE 570

Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Level is Rackham or Graduate or or Doctorate
- Can enroll if Major is Mechanical Engineering, Electrical Engineering, Industrial & Systems Engin, Computer & Information Science, Computer Engineering

ECE 614  Ctrl Networks for Embedded Sys  3 Credit Hours
Networks have emerged in a wide range of embedded applications (e.g. aerospace, maritime, vehicular, industrial) as an enabler of flexible and robust system design. These embedded control networks differ from information technology (IT) networks in that the primary users are not humans, but sensors, actuators, and embedded processors. Thus, the data sets, performance requirements, operational environment, and need for reliability and robustness necessitate a different approach to network design. As the complexity of the systems grows, developers will be presented with significant challenges. It is important that engineers are acquainted with fundamental tools and strategies for designing and building such networks. Three lecture hours per week.

Prerequisite(s): ECE 570

Restriction(s):
- Can enroll if Level is Rackham or Graduate or or Doctorate
- Can enroll if College is Engineering and Computer Science

ECE 615  Advanced Power Electronics  3 Credit Hours
This course covers advanced topics in power electronics with emphasis on hybrid vehicle and renewable applications. The course will cover topics such as resonant converters, vector control, field oriented control, battery chargers, vehicle to grid management, power factor correction and harmonic control, model predictive control, renewable energy systems (solar, wind and ocean) and their requirement for power converters, electric drive transportation components, silicon carbide power devices. Three hours per week.

Prerequisite(s): ECE 515

Restriction(s):
- Can enroll if Class is Graduate
- Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 616  Advanced Topics in Power Sys  3 Credit Hours
This course will cover the advanced topics of power system planning, operation, and control. The course will help students understand the algorithms and tools required to analyze electric power systems. The major focus of this course is to educate and train graduate students in developing research abilities through literature survey on advanced power system technologies and hands-on projects on modeling and analyzing smart grid applications. (F)

Prerequisite(s): ECE 541 or ECE 542

Restriction(s):
- Can enroll if Level is Graduate or Doctorate or Rackham or or Doctorate
- Can enroll if College is Engineering and Computer Science

ECE 642  Robotic Embed Sys  3 Credit Hours
Full Course Title: Robotic Embedded Systems This course covers advanced topics in embedded systems in the context of modern robotics. It is a research-oriented course including a research literature survey, a final project implementing a state-of-the-art algorithm or system, and a set of hands-on assignments that cover modern tools and real-time embedded systems development frameworks such as the Robot Operating System. Lecture and assignment topics include embedded software architectures and modular software frameworks for robotics, modern computer hardware, robot perception and embedded image processing, automatic code generation from higher level modeling languages (such as MATLAB and Simulink), deployment considerations, as well as other selected advanced topics. (YR)

Restriction(s):
- Can enroll if College is Engineering and Computer Science

ECE 643  Humanoids  3 Credit Hours
This course covers two major aspects of humanoid robots, locomotion and manipulation. The purpose of this course is to provide students with advanced techniques for generation and control of movement of a humanoid robot itself and its motion to change the environment. Articulated body dynamics, contact modeling, and contact dynamics will be presented first. Locomotion will cover balance control, footstep planning, walking gait generation, joint space trajectory planning, and human motion tracking. Manipulation will include grasping, optimal planning, and dynamic manipulation. Simulation techniques and software will be introduced. This course will include programming and simulation work and students will be required to accomplish a related course project. The course has three lecture hours per week. (W)

Prerequisite(s): ECE 5001 and ECE 540 or ECE 543

Restriction(s):
- Can enroll if College is Engineering and Computer Science
ECE 644  Advanced Robotics  3 Credit Hours
This course covers advanced topics related to current research in algorithms and artificial intelligence for robotics such as planning and control issues for robotic systems, taking into account the math and algorithms underneath state-of-the-art robotic systems. The majority of these techniques are heavily based on probabilistic reasoning and optimization-two areas with wide applicability in intelligent robotic systems. Students are expected to have knowledge of high-level programming language and will be required to accomplish a research-related course project. Three lecture hours per week. (W)
Prerequisite(s): (ECE 500 or ECE 5001) and ECE 544
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 645  Coop Robots  3 Credit Hours
This course covers advanced topics related to research in algorithms and methods for robots to cooperate. Topics include cooperation, connectivity, navigation, localization, perception, and control. Students will be expected to read research papers and complete a project with actual robots, e.g., TurtleBots. Three lecture hours per week. (W)
Restriction(s):
Can enroll if Level is Doctorate or Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 646  Adv Elec Drive Transportation  3 Credit Hours
This course gives in depth study in advanced technologies in the electrified vehicle powertrain. The course will cover topics such as hybrid powertrain architectures, dynamics of hybrid transmissions, battery management systems, battery control electronics, PHEV and HEV power management, survivability of military hybrid vehicles, packaging of PHEV electric drive components, optimization of PHEV components, optimization of electric drive efficiency through power management, vehicle to grid technology, emerging technology in electric drive transportation. Three hours per week.
Prerequisite(s): ECE 5462
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 650  Info Theory in Elec Comm  3 Credit Hours
Source models and source coding, channel and channel models, information measure, mutual information and entropy, coding for discrete sources such as variable-length codes and optimum variable-length encoding procedure, discrete memoryless channels and capacity, techniques for coding and decoding such as parity-check codes, cyclic codes, and Hamming codes, quantization and error analysis, coding techniques such as DPCM, run-length coding, sub-band coding, transform coding.
Prerequisite(s): ECE 555

ECE 661  Sys Ident and Adaptive Control  3 Credit Hours
Minimal state space models, on-line estimation schemes, parameter convergence for SISO and MIMO systems, direct and indirect adaptive prediction, minimum prediction error controllers (one-step ahead and model reference control), minimum prediction error adaptive controllers (direct and indirect approach), adaptive control algorithms for close-loop pole assignment, Kalman filter, extended Kalman filter.
Prerequisite(s): ECE 560

ECE 665  Optimal Control Systems  3 Credit Hours
Parameter optimization; optimization problems for deterministic systems; calculus of variations on optimal control; maximum principle of Pontryagin; dynamic programming; numerical solution of optimal programming and control problems; singular solutions.
Prerequisite(s): ECE 560

ECE 670  Adv Comp Netwk&WL Comm  3 Credit Hours
In depth study of advanced technologies in computer networks and wireless communications. The course will cover topics such as advances in Internet, wireless communications and sensor networks, wireless networked control systems, vehicular networks, smart grid, cloud computing, multimedia networking, and network security. Three lecture hours per week.
Prerequisite(s): (ECE 570 and ECE 5701) or CIS 627
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 675  Computer Architecture II  3 Credit Hours
Prerequisite(s): ECE 575

ECE 679  Adv Intelligent Sys  3 Credit Hours
This is a research seminar on advanced topics in intelligent systems. The course will focus on intelligent systems in solving complex problems. Topics include ensemble techniques, multi-objective optimization, and intelligent agents. The course will require student presentations and a substantial term project. Three lecture hours per week.
Prerequisite(s): ECE 579 or CIS 579
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 681  Adv Digital Sig Processing  3 Credit Hours
Topics include statistical signal processing, multi-rate systems, bank of filter design, multi-resolution formation of wavelet, the discrete wavelet transform, wavelet-based digital signal processing. The course has substantial computer simulation and research project components. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering
**Coursework Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5121</td>
<td>Mod &amp; Des of Electric Cir&amp;Sys</td>
<td>3</td>
</tr>
<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 565</td>
<td>Digital Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 567</td>
<td>Nonlinear Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5831</td>
<td>Pat Rec &amp; Neural Netwks</td>
<td>3</td>
</tr>
</tbody>
</table>

The following abbreviations are used to denote the frequency of offering:
- (F) fall term
- (W) winter term
- (S) summer term
- (F, W) fall and winter terms
- (YR) once a year
- (AY) alternating years
- (OC) offered occasionally

**Control Systems**

Control systems are the critical center of any vehicle system. Examples of control systems are numerous and multifaceted: climate control for passenger comfort in an automobile, automatic cruise control, engine control and pollution control are some typical illustrations. Design of control systems for practical applications requires a through understanding of physical models of the process, mathematical modeling techniques, transient behavior of systems and dynamic characteristics of a physical system.

The Control Systems certificate program will introduce the participants to mathematical techniques of system analysis, use of software, such as Matlab, to enhance the student’s experience, system modeling, continuous and discrete time control techniques, including analog and digital PID controllers, digital control, fuzzy logic control, neural network controller, etc. At the next level, participants will be introduced to multivariable control (control of several interacting variables of a physical process) and design strategies for multivariable processes. Finally, the program will introduce some basic concepts in nonlinear control and simple design techniques. Several case studies will be presented to enhance the learning experience. Group design projects will be assigned to ensure that the participants understand the design process. (12 credit hours)

**Cybersecurity and Information Assurance**

The Master of Science in Cybersecurity and Information Assurance (CIA) is a 30-credit hour graduate degree offered by the Department of Computer and Information Science (CIS). This initiative reflects the University’s eagerness to address rising needs of cybersecurity professionals in both the private and public sectors. The CIA program educates and trains an elite, diverse group of students who want to pursue a career in cybersecurity, such as cybersecurity analysts/specialists, cybersecurity engineers, network engineers/architects, software developers, etc. The program will also benefit anyone on this campus who is interested in advancing their knowledge of computer security and privacy, and it will offer a great opportunity for interdisciplinary inquiry and teaching.

**Curriculum**

To satisfy the requirements for the MS degree in Cybersecurity and Information Assurance, all students admitted to the program are
expected to complete a minimum of 30 credit hours of graduate coursework, with a cumulative grade point average of B or better. The program of study consists of core courses, concentration courses and electives with coursework/project/thesis options.

Option 1: MS Coursework. This option requires a minimum of 30 credits be earned through coursework. The minimum requirements are as follows:

- Core courses - 9 credit hours
- Concentration courses - 12 credit hours
- Elective courses - 9 credit hours

Option 2: MS Project. This option requires a project report describing the results of an independent study project under the supervision of the advisor. The scope of the research topic for the project should be defined in such a way that a full-time student could complete the requirements for a master’s degree in twelve months or three semesters following the completion of course work by regularly scheduling graduate research credits. The minimum requirements are as follows:

- Core courses - 9 credit hours
- Concentration courses - 12 credit hours
- Elective courses - 6 credit hours
- Master’s Project - 3 credit hours

Option 3: MS Thesis. This option requires a research thesis prepared under the supervision of the advisor. The thesis describes a research investigation and its results. The scope of the research topic for the thesis should be defined in such a way that a full-time student could complete the requirements for a master’s degree in twelve months or three semesters following the completion of course work by regularly scheduling graduate research credits. The minimum requirements are as follows:

- Core courses - 9 credit hours
- One concentration area - 12 credit hours
- Elective courses - 3 credit hours
- Master’s Thesis - 6 credit hours

Requirements
Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 601</td>
<td>Information Tech Auditing</td>
<td></td>
</tr>
<tr>
<td>CIS 540</td>
<td>Foundation of Info. Sec.</td>
<td></td>
</tr>
<tr>
<td>CIS 564/IMSE 570</td>
<td>Enterprise Information Systems</td>
<td></td>
</tr>
</tbody>
</table>

Concentrations
12 credit hours from one of the three concentrations listed below:

Data and Application Security

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 545</td>
<td>Data Security and Privacy</td>
<td></td>
</tr>
<tr>
<td>CIS 548</td>
<td>Sec and Priv in Cloud Comp</td>
<td></td>
</tr>
</tbody>
</table>

Network and System Security

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 549</td>
<td>Software Security</td>
<td></td>
</tr>
<tr>
<td>CIS 553</td>
<td>Software Engineering</td>
<td></td>
</tr>
<tr>
<td>CIS 565</td>
<td>Software Quality Assurance</td>
<td></td>
</tr>
</tbody>
</table>

Electives and Options

The following areas are provided for guidance only. Students are allowed to select elective courses from the same or different areas.

- Option 1: MS Coursework. Choose 9 credit hours (or 3 courses) from the following list below
- Option 2: MS Project. Choose 6 credit hours (or 2 courses) from the following list below and CIS 695 Master’s Project for 3 credits.
- Option 3: MS Thesis. Choose 3 credit hours (or 1 course) from the following list below and CIS 699 Master’s Thesis for 6 credits.

Note: An elective course should not be the same as any course taken to satisfy concentration course requirements.
### Core Courses (18 credit hours)

- **CIS 549** Software Security 3
- **CIS 584** Adv Comp Net Sec 3
- **ECE 527** Multimedia Secur & Forensics 3
- **HHS 570** Data Science and Ethics 3
- **ISM 642** Information Assurance 3

### Area 2: Systems, Networks and Communication

- **CIS 527** Computer Networks 3
- **CIS 537** Advanced Network & Dist Syst 3
- **CIS 574** Compiler Design 3
- **CIS 578** Advanced Operating Systems 3
- **CIS 647** Rsrch Advances Ntwkng&Dist Sys 3
- **ECE 526** Multimedia Comm Sys 3
- **ECE 535** Mob Dev & Ubiquys Comp Sys 3
- **ECE 550** Communication Theory 3
- **ECE 5541** Embedded Networks 3
- **ECE 570** Computer Networks 3
- **ECE 5701** Intro to Wireless Comm 3
- **ECE 5702** High-Speed and Adv Networks 3
- **ECE 531** Intelligent Vehicle Systems 3
- **ISM 525** Computer and Info Systems 3

### Area 3: Data Management, Analytics, and Intelligent Systems

- **CIS 536** Information Retrieval 3
- **CIS 556** Database Systems 3
- **CIS 5570** Introduction to Big Data 3
- **CIS 562** Web Information Management 3
- **CIS 568** Data Mining 3
- **CIS 5700** Advanced Data Mining 3
- **CIS 579** Artificial Intelligence 3
- **CIS 585** Adv AI 3
- **CIS 586** Advanced Data Management 3
- **CIS 658** Research Advances in Data Mgt 3
- **ECE 531** Intelligent Vehicle Systems 3
- **ECE 537** Data Mining 3
- **ECE 552** Fuzzy Systems 3
- **ECE 579** Intelligent Systems 3
- **ECE 5831** Pat Rec & Neural Netwks 3

### Area 4: Software Engineering

- **CIS 505** Algorithm Analysis and Design 3
- **CIS 525** Web Technology 3
- **CIS 535** Wireless Tech/Pervasive Cmptg 3
- **CIS 550** Obj-Oriet Prog and Its Applic 3
- **CIS 553** Software Engineering 3
- **CIS 565** Software Quality Assurance 3
- **CIS 566** Software Arch and Des Patterns 3
- **CIS 571** Web Services 3
- **CIS 575** Software Eng Mgmt 3
- **CIS 577** S/W User Interface Dsgn&Analys 3
- **CIS 580** Data Analytics in Software Eng 3
- **CIS 678** Research Advances Software Eng 3

### Area 5: Human Computer Interface Design

- **IMSE 514** Multivariate Statistics 3
- **IMSE 559** System Simulation 3
- **IMSE 577** Human-Computer Interaction 3
- **IMSE 586** Big Data Anal & Visualiztn 3
- **HCDE 501** Human Factors and Ergonomics 3
- **HCDE 510** Foundation of HCDE 3
- **HCDE 530** Information Visualization 3

### Data Science

#### About the Program

The Data Science master’s degree program is designed as a 30-credit hour interdisciplinary graduate program. The curriculum consists of required core courses and technical electives, providing opportunities to build knowledge and professional skills in various Data Science areas that are highly demanded in the current job market. Four concentrations are recommended (not mandatory) for students with different interests in Data Science:

#### Computational Intelligence Concentration

This concentration is recommended for those students who are interested in building their knowledge and professional skills to solve complex data analytics problems through learning and adapting based on data.

#### Applications Concentration

This concentration is recommended for those students who are interested in building their knowledge and professional skills to develop effective data analytics solutions in selected application domains.

#### Business Analytics Concentration

This concentration is recommended for those students who are interested in building their knowledge and professional skills to apply intelligent strategies and technologies to support the collection, data analysis, presentation and dissemination of business information in enterprises.

#### Big Data Informatics Concentration

This concentration is recommended for those students who are interested in building their knowledge and professional skills to apply cutting-edge technologies and tools to tackle Big Data challenges that are essential for data processing and analytics in numerous applications.

### Degree Requirements

Regular admission to the program requires a Bachelor degree in a Science, Technology, Engineering, or Mathematics (STEM) field earned from an accredited program with an average of B or better. Each applicant is required to present official, complete transcripts of prior college work. Three letters of recommendation are required for admission. At least one letter must be from someone familiar with the candidate's academic performance. An entering student should have completed one course in probability and statistics, one course in programming, and one course in calculus II. A course in calculus III and a course in linear algebra are recommended but not required.

### Curriculum Requirements

**Core Courses (18 credit hours)**
**Concentration Courses (9 credit hours)**

Note that the concentrations are offered for guidance only. Students may select a concentration or select three courses from any of the concentrations for a broader approach to the degree.

One of the following concentrations is recommended:

**Computational Intelligence Concentration**

This concentration is recommended for those students who are interested in building their knowledge and professional skills to solve complex data analytics problems through learning and adapting based on data.

**Applications Concentration**

This concentration is recommended for those students who are interested in building their knowledge and professional skills to develop effective data analytics solutions in selected application domains.

**Business Analytics Concentration**

This concentration is recommended for those students who are interested in building their knowledge and professional skills to apply intelligent strategies and technologies to support the collection, data analysis, presentation and dissemination of business information in enterprises.

**Big Data Informatics Concentration**

This concentration is recommended for those students who are interested in building their knowledge and professional skills to apply cutting-edge technologies and tools to tackle Big Data challenges that are essential for data processing and analytics in numerous applications.
Choose three courses from:

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<th>Code</th>
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<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 511</td>
<td>Natural Language Processing</td>
<td>3</td>
</tr>
<tr>
<td>CIS 534</td>
<td>Semantic Web</td>
<td>3</td>
</tr>
<tr>
<td>CIS 536</td>
<td>Information Retrieval</td>
<td>3</td>
</tr>
<tr>
<td>CIS 548</td>
<td>Sec and Priv in Cloud Comp</td>
<td>3</td>
</tr>
<tr>
<td>CIS 552</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 554</td>
<td>Info Sys Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 559</td>
<td>Prin of Social Netwk Science</td>
<td>3</td>
</tr>
<tr>
<td>CIS 560</td>
<td>Electronic Commerce</td>
<td>3</td>
</tr>
<tr>
<td>CIS 562</td>
<td>Web Information Management</td>
<td>3</td>
</tr>
<tr>
<td>CIS 557</td>
<td>Introduction to Big Data</td>
<td>3</td>
</tr>
<tr>
<td>CIS 5700</td>
<td>Advanced Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>CIS 571</td>
<td>Web Services</td>
<td>3</td>
</tr>
<tr>
<td>CIS 577</td>
<td>S/W User Interface Dsgn&amp;Analys</td>
<td>3</td>
</tr>
<tr>
<td>CIS 586</td>
<td>Advanced Data Management</td>
<td>3</td>
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<tr>
<td>ECE 524</td>
<td>Interactive Media</td>
<td>3</td>
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<tr>
<td>ECE 525</td>
<td>Multimedia Data Stor &amp; Retr</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5251</td>
<td>MM Design Tools I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5252</td>
<td>MM Design Tools II</td>
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<tr>
<td>ECE 528</td>
<td>Cloud Computing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 576</td>
<td>Information Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 585</td>
<td>Spatial Analysis and GIS</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 570</td>
<td>Enterprise Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 586</td>
<td>Big Data Aanal &amp; Visulitzn</td>
<td>3</td>
</tr>
<tr>
<td>OM 665</td>
<td>IT in SCM</td>
<td>3</td>
</tr>
</tbody>
</table>

Capstone Course (3 credit hours)

In consultation with a faculty advisor, the student should choose between a capstone course (recommended) or one additional course from his/her concentration. Acceptable capstone courses are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 695</td>
<td>Master's Project</td>
<td>3</td>
</tr>
<tr>
<td>DS 635</td>
<td>Analytics Experience Capstone</td>
<td>3</td>
</tr>
<tr>
<td>ECE 695</td>
<td>Master's Project</td>
<td>3</td>
</tr>
<tr>
<td>EMTG 590</td>
<td>Capstone Project</td>
<td>3</td>
</tr>
</tbody>
</table>

Note that no more than a total of 15 credit hours may be taken in the College of Business for this degree (core, concentrations, and capstone).

### Electric Energy Technology

This certificate program introduces theories and technologies in electric energy and related applications. Topics include power electronics, power system analysis, electric drives, motor drives, electric aspects of hybrid vehicles, and practical aspects of the design of power electronics devices. (12 credit hours)

This program is available on campus only.

### Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 500</td>
<td>Math Mthds for Elec &amp; Comp Eng</td>
<td>3</td>
</tr>
<tr>
<td>ECE 550</td>
<td>Communication Theory</td>
<td></td>
</tr>
<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td></td>
</tr>
<tr>
<td>ECE 580</td>
<td>Digital Signal Processing</td>
<td></td>
</tr>
</tbody>
</table>

### Core Courses

Select three courses from the following list:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ECE 500</td>
</tr>
<tr>
<td>ECE 550</td>
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<tr>
<td>ECE 560</td>
</tr>
<tr>
<td>ECE 580</td>
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</tbody>
</table>

### Concentration Courses

Select three courses from one or more of the concentration areas below:

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Systems:</td>
</tr>
<tr>
<td>ECE 519</td>
</tr>
<tr>
<td>ECE 552</td>
</tr>
<tr>
<td>ECE 560</td>
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<tr>
<td>ECE 565</td>
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<tr>
<td>ECE 567</td>
</tr>
<tr>
<td>ECE 5831</td>
</tr>
</tbody>
</table>

Digital Signal Processing:
Preparatory Courses

Students with inadequate background in Electrical/Computer Engineering may be required to meet with the department graduate advisor to determine the need for preparatory courses.

For further information contact:
Department of Electrical and Computer Engineering
University of Michigan-Dearborn, 4901 Evergreen Road
Room 206 ELB, Dearborn, MI 48128-2406
Tel: 313-593-5420 Fax: 313-583-6336

E-mail: umd-ecegrad@umich.edu

ECE 500 Math Mthds for Elec & Comp Eng 3 Credit Hours
Topics include: Transform Techniques using Fourier series, Fourier transforms, Laplace transforms and Sampling Theorem. Linear Algebra using eigen expansions, polynomial functions and matrices and determinants. Random Variables using probability density and distribution functions; functions of a random variable, and conditional and joint probabilities.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 5001 Analytic and Comp Math 3 Credit Hours
Full Title: Analytical and Computational Mathematics This course covers selected topics in applied mathematics useful in science and engineering fields, including: solution of linear equations, polynomial interpolation and approximation, solution of nonlinear equations, roots of polynomials, resultants, approximation by orthogonal functions (includes Fourier series), ordinary differential equations, optimization, calculus of variations, probability and stochastic processes, computational geometry, and differential geometry. In addition to providing students with necessary mathematical knowledge for their future course study and research projects, students will be required to program in MATLAB and/or other languages to gain and improve programming ability. Students in RE program must take this course in the first year. This course cannot be taken with ECE 500. Three lecture hours per week. (F)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 502 Electromag Theory & Simul 3 Credit Hours
The course will cover basic devices and applications in Electromagnetic waves. The course will use examples of electromagnetic devices that operate at low frequency, (e.g., coils and motors), and others that operate at high frequency (e.g., Optical fiber, Laser, Imaging Sensor, LEDs, Solar cells and Antenna.) The course will develop fundamental understandings for the behavior of these devices. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer Engineering, Electrical Engineering

Electrical Engineering
ECE 507 Intro to Multimedia Sys 3 Credit Hours
This course is designed to provide a broad overview of the engineering, art, and business of developing multimedia systems. In terms of technical and engineering issues, students will learn basic data analysis techniques and computer programming tools. In terms of art and media, students will learn the basics of human perception, communication, and aesthetics. In terms of business, students will learn how to identify customer needs and think like an entrepreneur. By learning and understanding the working vocabulary of each of these three fields, students will be able to contribute creative and effective multimedia-based solutions to interesting real-world problems. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 510 Vehicle Electronics I 3 Credit Hours
This course discusses the principles of electrical engineering and applications of electrical and electronic systems in automobiles, including resistive, inductive, and capacitive circuit analysis, semiconductor diodes, junction transistors, FETS, rectifiers, and power supplies, small signal amplifiers, biasing considerations, gain-bandwidth limitations, circuit models. Some automotive EE applications are used for case study. Three lecture hours per week. (Not open to students with EE degree.)
Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Major is Electrical Engineering, Computer Engineering

ECE 512 Analog Filter Design 3 Credit Hours
This course addresses the analysis and design of continuous time (analog) and switched-capacitor filters. Students will analyze and design filters. Effect of tolerances of circuit elements on the performance of the circuit behavior will be analyzed. Students will use simulation tools to design filters and verify circuit performance. Three lecture hours per week.
Prerequisite(s): ECE 314
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 514 VLSI Design 3 Credit Hours
Topics relevant to the design and analysis of VLSI circuits are investigated. These include an introduction to CMOS circuits, their characterization and performance estimation. Logic design and testing of VLSI circuits. Analysis of layout and the design of subsystems. VHDL and commercial CAD packages for VLSI design.
Prerequisite(s): ECE 413
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 510 Vehicle Electronics II 3 Credit Hours
This course discusses advanced topics in electronics with an emphasis on vehicle applications. It will include ignition systems and controls, amplifiers, frequency characteristics of electronic circuits, feedback in electronic systems and stability, power electronics and motor drive controls (DC/DC and DC/AC converters) and EMC issues. Selected examples include applications such as voltage regulators and battery chargers. Three lecture hours per week.
Prerequisite(s): AENG 510

ECE 516 Electronic Materials & IC Proc 3 Credit Hours
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 517 Adv Pwr Electmcs&Motor Drvs 3 Credit Hours
This is an advanced course on power electronics and electric drives. Example topics include DC, induction, synchronous and reluctance drives; industrial and residential application of power electronics; practical aspects of design of power electronics devices including heat sink and magnetic components designs. Three lecture hours per week.
Prerequisite(s): ECE 415
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 518 Mat Selec for Commercial Prod 3 Credit Hours
Impact of modern materials on commercial product performance; representative illustrations from product areas such as automotive vehicles, commercial aircraft, recreational equipment, and electronic products.
Restriction(s):
Can enroll if Class is Graduate

ECE 519 Adv Topics in EMC 3 Credit Hours
This course covers the EMC requirements and EMC test methods for large systems. Examples involving various types of applications (automotive, communications, computers) will be discussed. Discussion of design practices used in large installation, including component segregation, cable routing, connectors, grounding, shielding, common impedance coupling, ground planes, screening and suppression. Classification of electromagnetic environments will also be discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Electrical Engineering, Computer Engineering
ECE 524 Interactive Media 3 Credit Hours
This course will provide an introduction to computer and human interface and AI, user-interface design from design principles and cognitive perspectives. The course covers such topics innovative multimedia interfaces, design ethics, psychological principles, cognitive models, interaction principles, requirements analysis, project management, I/O devices, standards and styles guides, and visual design principles. This is a project-based class. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

ECE 525 Multimedia Data Stor & Retr 3 Credit Hours
This course will cover the fundamental concepts and techniques used in multimedia data, storage and retrieval including storage and retrieval images, videos, audio and text documents. Selected multimedia applications will be discussed and students will be required to work on a project based on multimedia applications such as advertising and marketing, education and training, entertainment, medicine, surveillance, wearable computing, biometrics, and remote sensing. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5251 MM Design Tools I 3 Credit Hours
This course will introduce students to design tools for multimedia systems. Basic concepts, algorithms, and standards will be covered for systems that process digital images, vector graphics, and text. Models and relevant parameters of display technologies (video and printer) will be discussed. Part of the coursework involves a project concerning the analysis and design of a multimedia-based system. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5252 MM Design Tools II 3 Credit Hours
This course will introduce students to multimedia design tools for dynamic media (video and audio). Basic concepts of digital video will be reviewed, such as resolution and compression standards. Algorithms and methods for video and audio processing and effects will be reviewed. Part of the coursework involves a project concerning the analysis and design of a multimedia-based system. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 526 Multimedia Comm Sys 3 Credit Hours
Object of this course is to introduce current techniques in multimedia communications. This course will cover in-depth study of existing multimedia compression standards such as, MPEG, MJEG, JPEG2000, etc. The course will introduce the basic issues in multimedia communications and networking and is designed to give the student hands-on experience in various aspects of multimedia communications through the various assignments and projects.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 527 Multimedia Secur & Forensics 3 Credit Hours
Object of this course is to introduce current techniques information security in general and multimedia security in particular. This course will cover existing information hiding techniques such as digital watermarking, steganography, and fingerprinting. The course will also cover basics of cryptography and coding theory. This course will cover the basic issues in multimedia security and forensics and is designed to give the student hands-on experience in various aspects of information security and forensic analysis through the various assignments and projects. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 528 Cloud Computing 3 Credit Hours
Cloud computing represents the emerging Internet-based services/platforms with elastic and scalable computation powers operating at costs associated with service. Topics of the course include advanced web technologies, distributed computing models and technologies, software as a service (SaaS), virtualization, pallelization, security/privacy and the advance in cloud computing. Course work includes building up a SaaS project. Students cannot take both ECE 428 and ECE 528 for degree credit. Three lecture hours per week.
Restriction(s):
Cannot enroll if Class is
Can enroll if Level is Graduate or Doctorate
Cannot enroll if Major is

ECE 529 Intro to Computer Music 3 Credit Hours
This course will introduce students to methods and technologies of computer music. The basics of digital audio will be covered, including sampling, quantization, and compression standards. Various analysis tools will be covered, including the Fourier transform and windowing techniques. Mathematical models of physical instruments will be introduced. Various sound synthesis strategies will be introduced: wave tables, additive synthesis, subtractive synthesis, frequency modulation, and granular synthesis. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 530 Energy Storage Systems 3 Credit Hours
This course introduces the basics of energy storage systems for EDV. It will cover battery basics, ultracapacitors, flywheels, and hybrid energy storage concepts. Battery management, battery charging, and battery safety will be covered. Finally, the requirements of EDV and renewable energy application examples will be explained. Lead acid, nickel metal hydride, and lithium ion batteries will be covered. Other energy storage systems such as super conducting magnetic, hydraulic, compressed air, and integrated (hybrid) energy storage systems, will be discussed as well.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science
ECE 531  Intelligent Vehicle Systems  3 Credit Hours
The course covers important technologies relevant to intelligent vehicle systems including systems architecture, in-vehicle electronic sensors, traffic modeling and simulation. Students will design and implement algorithms and simulate driver-highway interactions.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Rackham or Graduate or or Doctorate
Cannot enroll if Major is

ECE 532  Auto Sensors and Actuators  3 Credit Hours
Study of automotive sensory requirements; types of sensors; available sensors and future needs. Study of functions and types of actuators in automotive systems. Dynamic models of sensors and actuators. Integrated smart sensors and actuators. Term project.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 533  Active Automotive Safety Sys  3 Credit Hours
The course addresses enabling technologies relevant to active automotive safety systems. The study of intelligent vehicle systems includes system architectures, sensors, and algorithms. Modeling and simulation will also be covered. Students will design and simulate systems encompassing important concepts presented in the course.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 535  Mob Dev & Ubiqys Comp Sys  3 Credit Hours
This class will introduce students to the technology used in mobile/ smart devices and mobile communication networks. Various hardware and software aspects will be introduced, with particular emphasis on the constraints intrinsic to such system. Students will get an overview of various mobile operating systems and will learn how to develop software for mobile devices. The topics of ubiquitous and pervasive computing will be introduced and discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 536  All Weather Automotive Vision  3 Credit Hours
Coverage of the next generation of active automotive safety systems including intelligent cruise control, lane departure warning, virtual camber, and back-up and blind spot warning systems. Topics include active safety system architecture, enabling technologies for such systems, and future directions.
Restriction(s):
Can enroll if Class is Graduate

ECE 537  Data Mining  3 Credit Hours
Introduction to the fundamental concepts of data mining including data exploration, pre-and post-processing, OLAP predictive modeling, association analysis, and clustering. This course also focuses on the analysis of algorithms commonly used for of data mining applications, mining structured, semi-structured and unstructured data, stream data, and web data. Team oriented course project to provide hands-on experience may be required. Three lecture hours per week.
Prerequisite(s): ECE 479 or CIS 479
Restriction(s):
Can enroll if Class is Specialist or Graduate or Doctorate

ECE 539  Production of Elec Prods  3 Credit Hours
The course discussed the manufacturing of discrete components, integrated circuits, hybrid circuits and modules, advances packages, printed circuit boards, optical components, and MEMS products. Special topics on product testing, reliability assurance, accelerated reliability testing, product lifetime models, and automotive environments will also be addressed. The course will be organized as a combination of conventional lectures, workshops-style discussion, and design review sessions. Three lectures hours per week.
Restriction(s):
Can enroll if Major is Electrical Engineering, Manufacturing Engineering, Computer Engineering

ECE 541  Intro to Electrical Energy Sys  3 Credit Hours
The course will cover the sources of energy including coal, nuclear, solar, wind; their impact on the climate; and their technological characteristics in terms of availability, cost and reliability. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 542  Intr to Pwr Mgmt & Reliability  3 Credit Hours
This course will give students an introduction to power and energy management systems. Students will be exposed to a broad range of topics including optimal power flow, Smart Grid technology, economic dispatch, unit commitment, and the impact of renewable energy on power and management systems. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 543  Kinem, Dynam Control Robots  3 Credit Hours
Full Title: Kinematics, Dynamics, and Control of Robots This course provides a systematic study of robotics, covering various topics in kinematics, dynamics, control, and planning for robot systems. The purpose of this course is to let students get familiar with the traditional mathematical description of a robotic system and understand fundamental concepts and principles in robotics, to enable students to derive equations of motion for robotic systems, analyze their kinematic and dynamic properties, and design control strategies, and also to have students gain knowledge and experience about commonly-used robotic systems and mechanisms. Starting with rigid body motion, we will learn a systematic way to describe a robot system that consists of multiple links connected through different kinds of joints. Kinematics will include forward and inverse kinematics and their analytical and constraints. Control will include the classic PID control, position and force control, and trajectory tracking. This course will also discuss some specific topics in robotics research, including robot manipulators, mobile and walking robots, and robot hands, in which we will see how the above principles and methods are being used together. Three lecture hours per week. (W)
Prerequisite(s): ECE 347
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science
ECE 544 Mobile Robots 3 Credit Hours
This course gives an introduction to all the fundamentals of mobile robots, ranging from theory, such as kinematics, over hardware, such as sensors and motors, to core systems for sensory information processing, motion planning and control, and etc. A high level-overview of different types of mobile robots is presented first. Then, theoretical methods for analyzing the kinematic and dynamic properties of a mobile robot are discussed, followed by the discussion on the key subsystems of a mobile robot, including perception, localization, planning and control. For each subsystem, the discussion includes relevant methods for understanding and constructing the model of the environment or planning and controlling the motion of the robot. The course has three lecture hours per week. Students are expected to have knowledge of MATLAB or C/C++ programming and will be required to accomplish a course-related project. Three lecture hours per week. (F)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Graduate or Doctorate or
Can enroll if College is Engineering and Computer Science

ECE 545 Intro Robot Syst 3 Credit Hours
Full Title: Introduction to Robotic Systems. This course introduces basic components of robotic systems, selection of coordinate frames, homogeneous transformations, solutions to kinematics of manipulators, velocity and force/torque relations, dynamic equations using Euler-Lagrange formulation, obstacle avoidance and motion planning, classical controllers for manipulators and controller design using torque method, and robot simulation tools. Sensing technologies including basic computer vision will be covered. Robot simulation technologies and tools will be introduced. Robotic systems other than manipulators will be introduced at the end of this course. Three lecture hours per week. (F)
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 546 Electric Vehicles 3 Credit Hours
To introduce fundamental concepts and specifications of electric and hybrid vehicles; vehicle design fundamentals; motors for electric vehicles; controllers and power electronics; energy sources; engineering impact of electric vehicles and practical design considerations. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate

ECE 5462 Elec Aspects of Hybrid Vehicle 3 Credit Hours
To introduce fundamental concepts and the electrical aspects of HEV, including the design, control, modeling, battery and other energy storage devices, and electric propulsion systems. It covers vehicle dynamics, energy sources, electric propulsion systems, regenerative braking, parallel and series HEV design, practical design considerations, and specifications of hybrid vehicles. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 550 Communication Theory 3 Credit Hours
The basic limitations and alternatives for communications signaling are studied, using appropriate mathematical tools. The topics include: review of information measure; random process and vector description of signals and noise; optimum receiver principles; signaling alternatives; channel capacity; block and convolutional coding; waveform estimation concepts. Practical system examples are stressed.
Prerequisite(s): ECE 450
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 552 Fuzzy Systems 3 Credit Hours
A study of the concept of fuzzy set theory including operations on fuzzy sets, fuzzy relations, fuzzy measures, fuzzy logic, with an emphasis on engineering application. Topics include fuzzy set theory, applications to image processing, pattern recognition, artificial intelligence, computer hardware design, and control systems.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 553 Software/Hardware Rapid Prototyping 3 Credit Hours
Rapid prototyping technology is primarily aimed at reducing the lead times and costs associated with new product development. Rapid prototyping requires a good quality 3D CAD system. This course will cover the software and hardware widely used in the rapid prototyping, including Stereolithography (SLA) and virtual reality software and hardware used for rapid prototyping. (YR)
Restriction(s):
Can enroll if Class is Graduate

ECE 554 Embedded Systems 3 Credit Hours
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 5541 Embedded Networks 3 Credit Hours
Embedded network systems merge modern communications, networks, sensing, distributed control and mobile computing enabling novel applications in a broad area of control, automation, and distributed real time systems. The course will focus on vehicular communications and networking, autonomous vehicles and intelligent transportation systems, robotics networks, and smart grids. Topics include: an overview of embedded processors and microcontrollers, digital signal processors, field programmable gate arrays (FPGAs), sensors and actuators, embedded operating systems including various Linux and Android platforms, and embedded networks. Students will be exposed to advanced system design methods, modeling, simulation, and system verification and evaluation. A term project may be required. Three lecture hours per week.
Restriction(s):
Can enroll if Level is Specialist or Graduate or or Doctorate
ECE 5542  Embedded Sig Proc and Control  3 Credit Hours
This course bridges the gap between embedded software engineering principles and theoretical signal processing and control concepts. Topics include a survey of embedded software architectures, real-time principles and concerns, sensor and actuator interfacing, PIO feedback control systems, Audio/time-series filtering (IIR and FIR filters), embedded image processing, automatic code generation from higher level modeling languages such as MATLAB and Simulink, and working with single-board computers and digital signal processors (DSP). It is a project oriented course, with hands-on assignments, group projects and an individual research component. (F)
Prerequisite(s): ECE 473 or ECE 4951 or ECE 554
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Can enroll if College is Engineering and Computer Science

ECE 5543  Embedded System Security  3 Credit Hours
This course introduces fundamental concepts of information security and threat models. In depth study of the principles, algorithms, techniques, protocols and applications of embedded security, including secure software development, light weight cryptographic algorithms, information security protocols for embedded applications, tamper detection, automotive security, embedded network transactions, and other emerging embedded applications in the areas of IoT and cyber-physical systems will be covered. (W, YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 5544  Intro. to CPS Security  3 Credit Hours
This course covers introductory topics in cyber-physical systems (CPSs) security. This course is intended to expose students to fundamentals of security primitives specific to CPSs and to apply them to a broad range of current and future security challenges that such systems are facing. Much of the course addresses Industrial Control Systems and smart grids. However, students will be expected to generalize the concepts for other CPSs. Students will work with various tools and techniques used by hackers to compromise computer systems or otherwise interfere with normal operations. Students will also use tools that are unique to interacting with cyber-physical systems. The purpose of this course is NOT to teach students how to become hackers, but rather to teach them about threat models and attack vectors for cyber-physical systems so that they can develop countermeasures to defend against threats. (F, YR)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 5545  Sec. & Privacy for Smart Grids  3 Credit Hours
Full Course Title: Security and Privacy for Smart Grids The goal of this course is to provide a comprehensive understanding of the challenges, issues, solutions, and state-of-the-art research and best practices pertaining to the cyber-security of the modern power grids, also known as "smart power grids". The course is intended to provide an overview of information security, CPS security, risk assessment and mitigation, network security, attack-resiliency for bulk power systems, attack surface analysis and reduction techniques, cyber-security testbeds, security standards and best practices for critical infrastructure, e.g., smart power grids. This course will build the skills needed to design and test the protocols, policies, and specifications for enabling technologies that will guarantee the security and integrity of the smart power grid while preserving personal privacy. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 555  Stochastic Processes  3 Credit Hours
Review of probability and random variables. Introduction to stochastic processes; stationarity, ergodicity; auto correlation and cross correlation, linear systems with random inputs, spectral analysis, Wiener filtering, Kalman filtering. Applications to smoothing, parameters estimation, prediction, system identification.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 560  Modern Control Theory  3 Credit Hours
Introduction to linear spaces and operators; mathematical description of multiple input-output systems; state variables and state transition matrix; controllability and observability and its application to irreducible realization of transfer function matrices; state variable estimation; controller synthesis by state feedback; stability of linear systems; analysis of composite systems.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 565  Digital Control Systems  3 Credit Hours
Mathematical representation of digital control systems; z-transform and difference equations; classical and state space methods of analysis and design; direct digital control of industrial processes.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 566  Mechatronics  3 Credit Hours
Mechatronics, as an engineering discipline, is the synergistic combination of mechanical engineering, electrical engineering, control engineering, and computer science, all integrated through the design process. The course is to establish a working familiarity with the key engineering elements in the design and control of electro-mechanical systems in general and automotive systems in particular. The key engineering elements include microprocessor technology, electronics, sensors and actuators, data communication and interface, control algorithms, and mechanisms of machine elements. The course is to introduce a design methodology in an integrated system environment through case studies and design projects. (AY).
Prerequisite(s): ME 442 or ECE 365
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 567  Nonlinear Control Systems  3 Credit Hours
Nonlinearities in control systems; phase plane analysis; isoclines, equilibrium points, limit cycles, optimum systems; heuristic methods; harmonic balance, describing function, frequency response and jump phenomena, oscillations in relay systems; state space; optimum relay controls; stability; Liapunov's method.
Prerequisite(s): ECE 460
Restriction(s):
Can enroll if Class is Graduate or Doctorate

ECE 568  Stochastic Processes  3 Credit Hours
Review of probability and random variables. Introduction to stochastic processes; stationarity, ergodicity; auto correlation and cross correlation, linear systems with random inputs, spectral analysis, Wiener filtering, Kalman filtering. Applications to smoothing, parameters estimation, prediction, system identification.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 569  Computer-Based Automation  3 Credit Hours
Prerequisite(s): ECE 588 or ECE 539
Restriction(s):
Can enroll if Class is Graduate
Cannot enroll if Major is Electrical Engineering, Computer Engineering
ECE 570  Computer Networks  3 Credit Hours
A study of data communications and network architecture fundamentals. Topics include signals and data transmission, modulation, encoding, and public carriers and network architectures; data link network layer, and transport layer protocols; case studies of existing and emerging networks; wireless, embedded, and conventional wired systems. Three lecture hours per week.
Prerequisite(s): ECE 471
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is

ECE 571  Switching Theory  3 Credit Hours
Combinational and sequential logic design, minimization of combinational and sequential circuits, functional decomposition, reliable design and fault diagnosis; incompletely specified sequential machine design, asynchronous sequential circuits and interactive methods.
Prerequisite(s): ECE 273
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 572  Sequential Machines  3 Credit Hours
Prerequisite(s): ECE 571
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 575  Computer Architecture  3 Credit Hours
This course addresses the basics of computer architecture including central processing unit, instruction set design, input/output and RAID, main memory, cache, and virtual memory. Three lecture hours per week.
Prerequisite(s): ECE 375
Restriction(s):
Can enroll if Class is Graduate or Doctorate
Cannot enroll if Major is

ECE 5752  Reconfigurable Computing  3 Credit Hours
This course addresses advances in reconfigurable computing techniques, design, and research. The course topics include introduction to RC, Hardware Description Language (HDL) such as VHDL and Verilog HDL, System-On-Chip (SOC), and Network-On-Chip (NOC). Three lecture hours per week.
Prerequisite(s): ECE 475
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 576  Information Engineering  3 Credit Hours
This course will cover fundamental concepts of information engineering, including theoretical concepts of how information is measured and transmitted, how information is structured and stored, how information can be compressed and decompressed, and information networks such as social networks, affiliation networks and online networks, mathematical theories of information networks. Information engineering applications will be discussed. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering

ECE 577  Engineering in Virtual World  3 Credit Hours
An in-depth study of selected topics in design and development of virtual systems in industrial environments. Topics include cyberspaces, techniques for generating virtual worlds in engineering applications, building blocks of virtual environments including hardware and software. Case studies.
Prerequisite(s): ECE 273 and ECE 371
Restriction(s):
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science

ECE 5770  Autonomous UAS  3 Credit Hours
This course will introduce the basic concepts of autonomous unmanned aerial systems. Topics will include basic flight principles of fixed-wing and rotary-wing aircraft, inertial representations in 3D space, the principles of Bayesian state estimation, visual odometry, path planning, and autonomous navigation. This course will also cover aircraft actuation, sensors and perception (GPS, inertial measurements, ranging, and basic computer vision), sensor fusion technique, and motion control of unmanned aircraft. Students are expected to have knowledge of high-level programming language and will be required to accomplish a course project. Three lecture hours per week. (W)
Prerequisite(s): ECE 347 or IMSE 317
Restriction(s):
Can enroll if College is Engineering and Computer Science
ECE 578  Advanced Operating Systems  3 Credit Hours
Advanced techniques and uses in operating system design. Distributed operating systems. Message-based operating systems. Operating systems for parallel architectures. Layered techniques in operating systems. Formal models of operating systems. Current trends in operating system design.
Prerequisite(s): ECE 478 or CIS 450 or IMSE 450
ECE 579  Intelligent Systems  3 Credit Hours
Representative topics include: Intelligent systems design, training and evaluation, decision trees, Bayesian learning, reinforcement learning. A project will be required.
Prerequisite(s): ECE 479
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 5791  Vehicle Power Management  3 Credit Hours
This course provides graduate students with a clear understanding of the latest vehicle power management technologies with an emphasis on alternative fuel vehicles. The course will cover topics such as electrified powertrain configurations. Vehicle power management basic concepts, vehicle propulsion system modeling, vehicle power management approaches (analytical approach, wavelet transform technology, DP&QP, and intelligent systems methods). ESS (especially batter) management, power electronics in HESS and motor drive, HEV component optimization, HIL and SIL, vehicle power management future trends, and so on. Three hours per week.
Restriction(s):
Can enroll if Class is Graduate or Doctorate
ECE 580  Digital Signal Processing  3 Credit Hours
This course addresses the analysis and design of discrete-time signals and systems. Students will become familiar with the mathematical tools needed for digital signal processing such as the Fourier transform, frequency response, the sampling theorem, and z-transform method. Topics covered will include the design of digital filters (IIR and FIR filters), characteristics of analog-to-digital and digital-to-analog converters, the spectral analysis of signals, and discrete filters. Three lecture hours per week.
Prerequisite(s): ECE 300
Restriction(s):
Can enroll if Class is Graduate or Doctorate
ECE 5802  Multirate Sig Proc w/Apps  3 Credit Hours
This course provides an introduction to multirate digital signal processing with application in different fields of engineering, with a focus on the presentation of the theoretical foundation for all aspects of multirate digital signal processing. The course examines modern applications of multirate digital signal processing including the design of multirate filter banks, using the wavelets transforms to efficiently encode signals for compression purposes, spectral analysis and synthesis of signals. Students will apply software tools to analyze, design and simulate multirate digital signal processing systems. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
ECE 581  Arch for Digital Signal Proc  3 Credit Hours
This course introduces the architectural fundamentals and features of programmable digital signal processors. Numeric representations and arithmetic concepts are discussed, which include fixed-point and floating-point representation of numbers, native data word width, and IEE-754 floating-point representation. Memory architecture and memory structures of digital signal processors are examined. Programming concepts for DSP processors such as addressing, instruction set, execution control, pipelining, parallel processing and peripherals are discussed. Finally, students will work on related applications employing digital signal processors such as speech processing, instrumentation, and image processing. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science
ECE 582  Intro to Statistical DSP  3 Credit Hours
Review of discrete-time signals and systems, introduction of discrete-time random signals and variables, linear signal models, nonparametric power spectrum estimation, least-squares filtering and prediction, signal modeling and parametric spectral estimation, selected topics. (W).
Prerequisite(s): ECE 580*
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering
ECE 583  Artificial Neural Networks  3 Credit Hours
Students will gain an understanding of the language, formalism, and methods of artificial neural networks. The student will learn how to mathematically pose the machine learning problems of function approximation/supervised learning, associative memory and self-organization, and analytically derive some well-known learning rules, including backprop. The course will cover computer simulations of various neural network models and simulations. Three lecture hours per week.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Software Engineering, Electrical Engineering, Computer & Information Science, Computer Engineering
ECE 5831  Pat Rec & Neural Nets  3 Credit Hours
Students will gain understanding of the language, formalism, and methods of pattern recognition. Various solution approaches will be covered including statistical methods and neural network-based methods. Students will learn how to mathematically pose various pattern recognition problems and analytically derive some well-known statistical results and learning rules. In addition, the student will learn how to perform computer simulations of various statistical and neural network models, and learn how to select appropriate model parameters, such as network architecture, hidden layer size, and learning rate. Case Studies will be presented to illustrate a variety of applications.
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
ECE 584  Speech Processes  3 Credit Hours  
The course introduces the fundamentals of speech processing using digital signal processing methods and techniques. How speech is produced from the human vocal system and the different types of basic speech sound components is addressed, followed by methods to analyze speech signals in both the time domain and frequency domain. Applications of speech processing are also presented. Possible applications covered include speech synthesis, speech coding and speech recognition. A team-based term project may be required. Three lecture hours per week.  
Prerequisite(s): ECE 580  
Restriction(s):  
Can enroll if Class is Graduate  

ECE 585  Pattern Recognition  3 Credit Hours  
Introduction to pattern recognition (PR) as a process of data analysis. Representation of features in multidimensional space as random vectors. Similarity and dissimilarity measures in feature space. Bayesian decision theory, discriminant functions and supervised learning. Clustering analysis and unsupervised learning. Estimation and learning. Feature extraction and selection. Introduction to interactive techniques in PR. Applications of PR.  
Prerequisite(s): IMSE 317  
Restriction(s):  
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science  

ECE 586  Digital Image Processing  3 Credit Hours  
Monochrome and color vision in man and machines, image quantization edge detection, image enhancement, image restoration, color analysis and processing, multispectral image processing, texture analysis, image coding and compression, morphology, geometrical image modifications.  
Prerequisite(s): ECE 450  
Restriction(s):  
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science  

ECE 587  Sel Top:Image Proc/Mach Vision  3 Credit Hours  
A special topics course providing an in-depth examination of one or several areas in image processing and/or machine vision. Possible areas include medical imaging, advanced concepts in morphology, stereovision, shape form shading, and active vision.  
Prerequisite(s): ECE 586  
Restriction(s):  
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science  

ECE 588  Robot Vision  3 Credit Hours  
This course introduces important theory and modern technology in robot vision. Representative topics are sensors and image formation, advanced algorithms in object feature filtering, extraction and recognition, texture and colors, motion, 3D vision, and applications. Students cannot receive credit for both ECE 4881 and ECE 588. Three lecture hours per week.  
Restriction(s):  
Can enroll if Major is Computer Engineering, Electrical Engineering, Computer & Information Science  

ECE 589  Multidimen Digital Signal Proc  3 Credit Hours  
Topics include multidimensional signal analysis methodologies, signal representation, 2-D FIR filter, 2-D recursive systems and IIR filters, spectral estimation and methods, multidimensional signal restoration applications in 2-D and 3-D image processing, reconstruction, and feature estimation. Three lecture hours per week.  
Prerequisite(s): ECE 580  
Restriction(s):  

ECE 590  Selected Topics  1 to 3 Credit Hours  
Individual or group study, design, or laboratory research in a field of interest to the students. Topics may be chosen from any of the areas of electrical engineering. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term.  
Restriction(s):  
Can enroll if Class is Graduate  
Can enroll if Major is Electrical Engineering, Computer Engineering  

ECE 591  Directed Studies  1 to 3 Credit Hours  
Special projects for laboratory or library investigation with the intent of developing initiative and resourcefulness. The student will submit a report of the project and give an oral presentation to a panel of faculty members at the close of the term.  
Restriction(s):  
Can enroll if Class is Graduate  
Can enroll if Major is Electrical Engineering, Computer Engineering  

ECE 592  Directed Research  1 to 3 Credit Hours  
Special problems centered on developing experimental skills. In consultation with a faculty advisor a student will prepare a proposal describing the work to be performed for approval by the department. An oral presentation and a final report on the research effort are required for completion. (F,W,S)  
Restriction(s):  
Can enroll if Class is Graduate  
Can enroll if Major is Electrical Engineering, Computer Engineering  

ECE 610  Analog IC  3 Credit Hours  
*****NO DESCRIPTION AVAILABLE****  

ECE 612  Wireless Sensor Networks  3 Credit Hours  
Advanced data communications, sensor motes, systems architecture and design, wireless communications standards and protocols, routing, security, operating systems, language support, and applications. Three lecture hours per week.  
Prerequisite(s): ECE 570  
Restriction(s):  
Can enroll if Class is Graduate  
Can enroll if Level is Rackham or Graduate or or Doctorate  
Can enroll if Major is Mechanical Engineering, Electrical Engineering, Industrial & Systems Engin, Computer & Information Science, Computer Engineering  

ECE 614  Ctrl Networks for Embedded Sys  3 Credit Hours  
Networks have emerged in a wide range of embedded applications (e.g. aerospace, maritime, vehicular, industrial) as an enabler of flexible and robust system design. These embedded control networks differ from information technology (IT) networks in that the primary users are not humans, but sensors, actuators, and embedded processors. Thus, the data sets, performance requirements, operational environment, and need for reliability and robustness necessitate a different approach to network design. As the complexity of the systems grows, developers will be presented with significant challenges. It is important that engineers are acquainted with fundamental tools and strategies for designing and building such networks. Three lecture hours per week.  
Prerequisite(s): ECE 570  
Restriction(s):  
Can enroll if Level is Rackham or Graduate or or Doctorate  
Can enroll if College is Engineering and Computer Science  
ECE 615  Advanced Power Electronics  3 Credit Hours
This course covers advanced technologies in power electronics with emphasis on hybrid vehicle and renewable applications. The course will cover topics such as resonant converters, vector control, field oriented control, battery chargers, vehicle to grid management, power factor correction and harmonic control, model predictive control, renewable energy systems (solar, wind and ocean) and their requirement for power converters, electric drive transportation components, silicon carbide power devices. Three hours per week.
Prerequisite(s): ECE 515
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or Doctorate

ECE 616  Advanced Topics in Power Sys  3 Credit Hours
This course will cover the advanced topics of power system planning, operation, and control. The course will help students understand the algorithms and tools required to analyze electric power systems. The major focus of this course is to educate and train graduate students in developing research abilities through literature survey on advanced power system technologies and hands-on projects on modeling and analyzing smart grid applications. (F)
Prerequisite(s): ECE 541 or ECE 542
Restriction(s):
Can enroll if Level is Graduate or Doctorate or Rackham or
Can enroll if College is Engineering and Computer Science

ECE 643  Humanoids  3 Credit Hours
This course covers two major aspects of humanoid robots, locomotion and manipulation. The purpose of this course is to provide students with advanced techniques for generation and control of movement of a humanoid robot itself and its motion to change the environment. Articulated body dynamics, contact modeling, and contact dynamics will be presented first. Locomotion will cover balance control, footstep planning, walking gait generation, joint space trajectory planning, and human motion tracking. Manipulation will include grasping, optimal planning, and dynamic manipulation. Simulation techniques and software will be introduced. This course will include programming and simulation work and students will be required to accomplish a related course project. The course has three lecture hours per week. (W)
Prerequisite(s): ECE 5001 and ECE 540 or ECE 543
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 644  Advanced Robotics  3 Credit Hours
This course covers advanced topics related to current research in algorithms and artificial intelligence for robotics such as planning and control issues for robotic systems, taking into account the math and algorithms underneath state-of-the-art robotic systems. The majority of these techniques are heavily based on probabilistic reasoning and optimization-two areas with wide applicability in intelligent robotic systems. Students are expected to have knowledge of high-level programming language and will be required to accomplish a research-related course project. Three lecture hours per week. (W)
Prerequisite(s): (ECE 500 or ECE 5001) and ECE 544
Restriction(s):
Can enroll if College is Engineering and Computer Science

ECE 645  Coop Robots  3 Credit Hours
This course covers advanced topics related to research in algorithms and methods for robots to cooperate. Topics include cooperation, connectivity, navigation, localization, perception, and control. Students will be expected to read research papers and complete a project with actual robots, e.g., TurtleBots. Three lecture hours per week. (W)
Restriction(s):
Can enroll if Level is Doctorate or Rackham or Graduate
Can enroll if College is Engineering and Computer Science

ECE 646  Adv Elec Drive Transportation  3 Credit Hours
This course gives in depth study in advanced technologies in the electrified vehicle powertrain. The course will cover topics such as hybrid powertrain architectures, dynamics of hybrid transmissions, battery management systems, battery control electronics, PHEV and HEV power management, survivability of military hybrid vehicles, packaging of PHEV electric drive components, optimization of PHEV components, optimization of electric drive efficiency through power management, vehicle to grid technology, emerging technology in electric drive transportation. Three hours per week.
Prerequisite(s): ECE 5462
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 650  Info Theory in Elec Comm  3 Credit Hours
Source models and source coding, channel and channel models, information measure, mutual information and entropy, coding for discrete sources such as variable-length codes and optimum variable-length encoding procedure, discrete memoryless channels and capacity, techniques for coding and decoding such as parity-check codes, cyclic codes, and Hamming codes, quantization and error analysis, coding techniques such as DPCM, run-length coding, sub-band coding, transform coding.
Prerequisite(s): ECE 555

ECE 661  Sys Idnt and Adaptive Control  3 Credit Hours
Minimal state space models, on-line estimation schemes, parameter convergence for SISO and MIMO systems, direct and indirect adaptive prediction, minimum prediction error controllers (one-step ahead and model reference control), minimum prediction error adaptive controllers (direct and indirect approach), adaptive control algorithms for close-loop pole assignment, Kalman filter, extended Kalman filter.
Prerequisite(s): ECE 560
ECE 665  Optimal Control Systems  3 Credit Hours
Parameter optimization; optimization problems for deterministic systems; calculus of variations on optimal control; maximum principle of Pontryagin; dynamic programming; numerical solution of optimal programming and control problems; singular solutions.
Prerequisite(s): ECE 560

ECE 670  Adv Comp Netw&WL Comm  3 Credit Hours
In depth study of advanced technologies in computer networks and wireless communications. The course will cover topics such as advances in Internet, wireless communications and sensor networks, wireless networked control systems, vehicular networks, smart grid, cloud computing, multimedia networking, and network security. Three lecture hours per week.
Prerequisite(s): (ECE 570 and ECE 5701) or CIS 627
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 675  Computer Architecture II  3 Credit Hours
Prerequisite(s): ECE 575

ECE 679  Adv Intelligent Sys  3 Credit Hours
This is a research seminar on advanced topics in intelligent systems. The course will focus on intelligent systems in solving complex problems. Topics include ensemble techniques, multi-objective optimization, and intelligent agents. The course will require student presentations and a substantial term project. Three lecture hours per week.
Prerequisite(s): ECE 579 or CIS 579
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

ECE 681  Adv Digital Sig Processing  3 Credit Hours
Topics include statistical signal processing, multi-rate systems, bank of filter design, multi-resolution formation of wavelet, the discrete wavelet transform, wavelet-based digital signal processing. The course has substantial computer simulation and research project components. Three lecture hours per week.
Prerequisite(s): ECE 580
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Computer Engineering, Software Engineering, Industrial & Systems Engin, Mechanical Engineering, Computer & Information Science, Electrical Engineering

ECE 691  Adv Directed Studies  1 to 3 Credit Hours
Advanced Directed Studies for Doctoral Students: Special topic in electrical or computer engineering. A project report and a seminar are required.
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if College is Engineering and Computer Science

ECE 695  Master's Project  3 Credit Hours
Application of the methodologies, tools and theory of software engineering to produce a specific validated software product. Projects can be faculty-generated, self-generated, and/or work related. All projects must be undertaken with one or more students under the supervision of the instructor. Prior to enrollment, a project proposal must be prepared and approved by the instructor and department chair. Standard software engineering documents must be prepared and approved at each phase of the project, and an oral presentation of the project is required. Course includes lectures and case studies. Permission of instructor required.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Software Engineering

ECE 699  Master's Thesis  3 or 6 Credit Hours
Graduate students electing the thesis option, working under the general supervision of a member of the department faculty, are expected to plan and carry out the work themselves. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term.
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Major is Electrical Engineering, Computer Engineering

ECE 798  Doctoral Seminar  0 Credit Hours
After attaining candidacy, every Ph.D. student is required to attend and actively participate in research seminars given by CECS Dean’s office or individual departments in CECS. A student gets a satisfactory grade if he/she attends at least two research seminars during the course period. (F,W,S)
Restriction(s):
Can enroll if Major is

ECE 980  Pre-Cand Dissertation Research  1 to 9 Credit Hours
Full Title: Pre-Candidate Dissertation Research Dissertation work by a pre-candidate student in Electrical and Computer Engineering program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate
Can enroll if Major is

ECE 990  Doctoral Dissertation  1 to 9 Credit Hours
Full Title: Doctoral Dissertation Research Dissertation work by a Ph.D. candidate in Electrical and Computer Engineering program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate
Can enroll if Major is

* An asterisk denotes that a course may be taken concurrently.
The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

**Electrical, Electronics, and Computer Engineering**

The EECE Ph.D. program addresses the critical need for engineers who are proficient in emerging technologies, knowledgeable in the latest advancements in science and engineering and research that combines deep knowledge in both electrical and computer-related areas. The Ph.D. degree is aimed primarily at those who wish to have academic as well as research and development careers.

This Ph.D. program of the Rackham Graduate School of the University of Michigan-Ann Arbor is located, administered, and offered by UM-Dearborn. The program observes the standards for admissions, registration, degree requirements, awarding of degrees, and other administrative policies and regulations established by the Executive Board of the Rackham Graduate School.

The EECE Ph.D. degree requirements include a minimum of 36 credits of coursework and a minimum of 24 credit hours of dissertation credits for Ph.D. students entering the program without a prior M.S. degree. Students without a master's degree may work toward an M.S. in Electrical Engineering or M.S. in Computer Engineering as part of the candidacy requirements. Both M.S. EE and M.S. CE require 30 credits of graded coursework. To complete the Ph.D. program, students will typically complete a minimum of 6 additional credits hours in coursework in order to satisfy the specific course requirements.

Students with a prior M.S. degree must satisfy the same course requirements or the equivalent from other institutions, as approved by the ECE Graduate Committee. In addition, they must complete 18 credit hours of graded coursework or directed study and a minimum of 24 credit hours of dissertation coursework at the University of Michigan-Dearborn to satisfy the Rackham residency requirement. Waiver of this requirement will be considered for students who obtained their master's degree from a University of Michigan program in a similar area and whose coursework meets the Ph.D. program requirements.

**Step 1. Pre-Candidacy**

At the beginning of their enrollment in the ECE Ph.D. Program, students will typically take a series of courses to satisfy the depth, breadth, and advanced mathematics requirements. A study plan should be made by every student under consultation with the student’s advisor, which will outline the courses and research activities for meeting the milestones of the ECE Ph.D. program. The student's study plan needs to be approved by the ECE Ph.D. Committee, and a copy of the study plan will be included in the student’s file. Any change of the study plan must be approved by the ECE Ph.D. Committee.

**Breadth Requirement**

Students must select three courses from three different core areas. Equivalency is possible. Courses selected to fulfill the ECE Ph.D. Breadth requirement may not also be used to fulfill the ECE Ph.D. Depth requirement. All Ph.D. breadth courses must be completed with a grade of B+ or better within 3 full terms (1 1/2 years) for a student with a relevant Master's degree and 4 full terms (2 years) for all other students. Courses taken at another university that are equivalent in level and content may fulfill one or more of these requirements with appropriate approval.

**Depth Requirement**

The Depth coursework requirement is designed to ensure that students complete graduate-level coursework relevant to their chosen area of specialization and acquire the core research skills and knowledge of the current research and technologies relevant to this specialization. Here, students must select two courses from one core area, including at least one advanced course (indicated with an asterisk). The Depth courses must be completed with a grade of A- or better. These courses may not be completed via equivalency. These courses must be completed within 3 full terms (1 1/2 years) for a student with a relevant Master's degree and 4 full terms (2 years) for all other students.

**Technical Electives**

Students can take any courses in the four core areas listed below. The selected courses must be approved by the student’s research advisor and the Ph.D. Program Committee and a signed Depth Course Approval form must be submitted when signing up for the Qualifying Examination.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ECE 514</td>
<td>VLSI Design</td>
<td></td>
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<tr>
<td>ECE 528</td>
<td>Cloud Computing</td>
<td></td>
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<tr>
<td>ECE 535</td>
<td>Mob Dev &amp; Ubiquous Sys</td>
<td></td>
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<tr>
<td>ECE 550</td>
<td>Communication Theory</td>
<td></td>
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<tr>
<td>ECE 554</td>
<td>Embedded Systems</td>
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<tr>
<td>ECE 570</td>
<td>Computer Networks</td>
<td></td>
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<tr>
<td>ECE 5701</td>
<td>Intro to Wireless Comm</td>
<td></td>
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<tr>
<td>ECE 5702</td>
<td>High-Speed and Adv Networks</td>
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<tr>
<td>ECE 575</td>
<td>Computer Architecture</td>
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<td>ECE 5752</td>
<td>Reconfigurable Computing</td>
<td></td>
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<tr>
<td>ECE 578</td>
<td>Advanced Operating Systems</td>
<td></td>
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<tr>
<td>ECE 5542</td>
<td>Embedded Sig Proc and Control</td>
<td></td>
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<tr>
<td>ECE 612</td>
<td>Wireless Sensor Networks</td>
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<tr>
<td>ECE 614</td>
<td>Ctrl Networks for Embedded Sys</td>
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<tr>
<td>ECE 670</td>
<td>Adv Comp Netwk&amp;WL Comm</td>
<td></td>
</tr>
<tr>
<td>ECE 675</td>
<td>Computer Architecture II</td>
<td></td>
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</tbody>
</table>
Advanced Mathematics

Student must take at least one advanced mathematics course. A list of approved advanced mathematics courses is presented below. It is acceptable to use advanced mathematics courses to meet the cognate course requirement.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 504</td>
<td>Dynamical Systems</td>
<td>3</td>
</tr>
<tr>
<td>MATH 5055</td>
<td>Integral Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 512</td>
<td>First Course in Modern Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 514</td>
<td>Fin Diff Meth for Diff Equat</td>
<td>3</td>
</tr>
<tr>
<td>MATH 515</td>
<td>B-Splines &amp; Their Applications</td>
<td>3</td>
</tr>
<tr>
<td>MATH 516</td>
<td>Fin Elemnt Meth for Diff Equat</td>
<td>3</td>
</tr>
<tr>
<td>MATH 520</td>
<td>Stochastic Processes</td>
<td>3</td>
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<tr>
<td>MATH 525</td>
<td>Mathematical Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 551</td>
<td>Advanced Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 552</td>
<td>Advanced Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 554</td>
<td>Fourier and Boundary</td>
<td>3</td>
</tr>
<tr>
<td>MATH 555</td>
<td>Func of a Complex Var with App</td>
<td>3</td>
</tr>
<tr>
<td>MATH 558</td>
<td>Introduction to Wavelets</td>
<td>3</td>
</tr>
<tr>
<td>MATH 562</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MATH 583</td>
<td>Discrete Optimization</td>
<td>3</td>
</tr>
<tr>
<td>MATH 584</td>
<td>Applied&amp;Algorithmic Graph Thy</td>
<td>3</td>
</tr>
<tr>
<td>MATH 592</td>
<td>Introduction to Topology</td>
<td>3</td>
</tr>
</tbody>
</table>

Directed Study

All students who aspire to receive a Ph.D. must demonstrate a potential for conducting original research. This is accomplished by completing either three or six credit hours of a research-oriented directed study prior to the Preliminary Exam. These must be taken while in residence on the UMD campus. Ph.D. students must complete all credits of ECE 691 within their first two semesters. At least 3 credit of ECE 691 must be completed in the concentration area of the degree and prior to taking the Qualifying Exam.

Ph.D. Research Seminar

All Ph.D. students will participate in ECE research seminars and colloquia, which will expose them to eminent researchers and current research topics in the broad areas of ECE.

Ph.D. Research Methodology Seminar

The seminar will include the required training in responsible conduct of research and scholarship. This seminar will carry no credit hours. Passing is based on participation and attendance with the exception of the Responsible Conduct of Research and Scholarship Training module of the Methodology seminar, for which a test will be required.

Cognate Credits

The cognate requirement is intended to foster intellectual breadth in graduate studies. Students must undertake at least 4 credit hours of coursework in an area outside of their chosen field of specialization. The cognate requirement should be approved by the Ph.D. Program Committee, and will generally be satisfied in one of the following ways:

1. Completion of at least 4 credit hours of cognate coursework in one or more approved graduate-level courses listed with a grade of B
or better. No more than 6 credit hours of cognate courses can be counted towards the degree requirement.

2. Completion of graduate coursework at another institution that meets the expectation of the cognate requirement. This coursework must be completed no more than 5 years before admission to the EECE Ph.D. program.

**Qualifying Examination**
The Ph.D. qualifying examination is intended to allow a Ph.D. student to demonstrate her/his potential for conducting original research.

A Ph.D. student must complete at least one directed study course of ECE 591/691 prior to the Qualifying Exam. The directed study course must be taken as a Rackham student at the ECE Department at UM-Dearborn. During their first year in the Ph.D. program, students are required to perform independent research in collaboration with an ECE faculty member. The intent of this research requirement is to provide adequate opportunity for students to work closely with a research advisor to prepare to take the qualifying exam before their qualification deadline. The first-year research requirement is a condition of continued departmental financial support guarantees and can be waived only by petition to the Ph.D. Program Committee with an explanation of special circumstances (e.g., a research-oriented internship directly relevant to the student’s qualifying exam preparation) endorsed by the student’s academic or research advisor. This requirement does not apply to students who transfer from a terminal MS to the Ph.D. program, who will be given more than one calendar year after entering the MS program.

The student’s qualification is evaluated through a written report of a project done in a research-oriented directed study, followed by a 1-2 hour oral exam by a Ph.D. Qualifying Examination Committee, which consists of three faculty members not including the research advisor, two of which are ECE faculty and one is an affiliate faculty. The three faculty members on the Ph.D. qualifying committee are selected by the ECE Ph.D. Program Committee. The oral examination will cover the student’s directed study project and knowledge directly related to the student’s research area. This examination will be administered during the qualification examination period in every Fall and Winter semester. The director of the students’ directed study project may not serve as one of the examiners. The student must submit four copies of the directed study written report to the ECE Ph.D. Program Coordinator at least two weeks before the qualifying examination. The examiners will be given the written report at least one week before the examination.

The faculty in the qualifying examination committee will grade students on a scale of 1-4, representing Poor, Fair, Good and Excellent, respectively. An average score across all faculty members on the examination committee will be at least 3.0 in order to pass the qualifying examination. A student is given two chances to take the qualifying examination within the first three years.

**Step 2. Candidacy**
Students are initially admitted to the program as pre-candidates. Candidacy will normally be achieved in the second or third year of study after completion of the Qualifying Examination and completion of at least three semesters of courses with a grade-point-average of at least 3.5 over a scale of 1-4. A student will be admitted to Ph.D. Candidacy only if she/he satisfies every requirement below.

**Candidacy Requirements**
1. Successful completion of the ECE Qualifying Examination, which is described below.
2. Fulfillment of all course requirement and all other candidacy requirements such as cognate coursework with a grade-point-average of at least 3.4 over a scale of 1–4. A student may satisfy the Ph.D. cognate requirement—four to six hours of graduate-level coursework — by taking the graduate course(s) associated with CECS programs (not his/her own), by taking the graduate course(s) outside the department, or by a mixture thereof. Courses taken from other programs cannot overlap in content with any ECE course-related material. Any course in question must have prior approval of the ECE Ph.D. Program Committee.
3. Soon after passing the Qualifying Examination, the candidate and the advisor will form a Dissertation Committee, which should be submitted to the ECE Ph.D. Program Committee for preliminary approval. Normally the advisor serves as chair or co-chair of this committee. It is the responsibility of the student and the advisor to find eligible faculty members willing to serve. A typical Ph.D. Dissertation Committee will consist of three regular ECE faculty, one industry expert with a Ph.D. degree, and one faculty member outside of the ECE department. The Dissertation Committee is responsible for reviewing the student’s progress, including the dissertation proposal and the final dissertation. The dissertation committee must be approved by the ECE. Ph.D. Program Committee at least one month before the dissertation proposal examination date.
4. A student must apply for candidacy by submitting the appropriate forms to the ECE Ph.D. Program Committee. These forms must be submitted before the student plans to become a candidate. Candidacy is not awarded automatically; it must be applied for.

The achievement of candidacy is considered an important milestone in a Ph.D. student’s progress, and all students are expected to apply for candidacy as soon as they are eligible. Full-time students with a relevant Master’s degree must achieve candidacy in four terms (2 years). Students that have only a Bachelor’s degree will be allowed six terms (3 years) to achieve candidacy. Part-time students with a relevant Master’s degree must achieve candidacy in six terms (2.5 years). Part-time students that have only a Bachelor’s degree will be allowed eight terms (4 years) to achieve candidacy.

**Step 3. Dissertation**

**Dissertation Committee**
The Dissertation Committee will consist of the chair and at least three other members. The student’s dissertation advisor will serve as chair. Of the additional members, two must hold at least 50% appointment as tenured or tenure-track faculty of the Computer and Information Science Department, with at least one being a member of the graduate faculty. The third committee member must be from outside the department: a faculty from another department or another university or an expert from industry.

The composition of the Dissertation Committee has to be approved by the Ph.D. Program Committee.

**Dissertation Proposal**
A full-time (part-time) student entering with a Bachelor degree must successfully complete a dissertation proposal within 3.5 (4) years from the start of graduate study to maintain satisfactory progress. A student full-time (part-time) with a relevant Master’s degree must complete the
dissertation proposal examination within 2.5 (3) years. The dissertation proposal examination will be administered by the Dissertation Committee (see above). The student will submit a dissertation research proposal to the Dissertation Committee at least two weeks in advance of the date of an oral examination. In the written proposal, the student must precisely identify the intellectual area in which he or she intends to pursue research and must demonstrate an in-depth understanding of that area. The student must give a general description of the research problem to be addressed and an outline of the approach that will be taken. It is desirable that the research problem be specified in considerable detail and that some initial results be presented. During the oral presentation, the student will present the proposed dissertation research, including relevant background material and preliminary research results. During and after the presentation, the Dissertation Committee will explore the research area with the student to determine whether the student has completed this phase successfully. The Dissertation Committee will prepare a written evaluation report on the outcome of the proposal presentation, and a copy of the written proposal will be placed in the student’s file. Students may receive one of the two possible outcomes, (1) the Dissertation Committee has approved the dissertation proposal, or (2) the student needs to revise the dissertation proposal and take the proposal examination one more time.

**Dissertation and Final Defense**

After the dissertation proposal has been approved, the candidate may proceed with the dissertation research and the writing of the dissertation. Upon completion of the dissertation, the student must receive a written evaluation of her/his dissertation from each member of the Dissertation Committee, and must defend her/his dissertation orally in an open examination (the Final Defense) before the Dissertation Committee, in accordance with Rackham rules. The dissertation defense may not be scheduled in the same academic term as the dissertation proposal examination.

Dissertation Proposal Examination and the dissertation oral defense should be at least 14 weeks.

**Energy Systems Engineering**

Energy Systems Engineering is a 30 credit hour program, designed to provide systems-based knowledge in energy engineering through four core courses and in-depth knowledge in automotive energy and distributed energy systems through six elective courses. The core courses deal with sustainable energy sources, energy generation and storage, energy and environmental policies, and risk-benefit analysis. The elective courses can be selected from a range of courses offered in the fields of energy systems engineering.

The elective courses cover a variety of topics, such as hybrid and electric vehicles, alternative energy systems for vehicles, emissions, power electronics, power distribution, design and manufacturing for environment, etc.

The Energy Systems Engineering program has been designed to address the educational need for graduate students interested in energy engineering. Significant growth and investment are expected to occur in energy industries in the State of Michigan and elsewhere in the next several decades. Both small and large energy-related companies are starting up in the State and many of them are located in the metro-Detroit area. The automotive companies are also accelerating research and development in new power generation and propulsion technologies for future vehicles, such as electric batteries and fuel cells. As a result, there is a need for engineers with specialized knowledge in the alternative and renewable energy production, utilization and distribution.

**Online program option:**

The Energy Systems Engineering program is also offered online through the Distance Learning Network ([https://umdearborn.edu/cecs/extended-learning-outreach/online-learning/](https://umdearborn.edu/cecs/extended-learning-outreach/online-learning/)) (DLN). The online courses utilize video streaming of the lectures given on campus. The online students have the opportunity to interact with the instructors and with fellow students (both on campus as well as online) through CANVAS. The class lectures, notes and discussions are posted on CANVAS for online students’ access.

**Program Goals:**

To provide students with systems-oriented graduate level knowledge in the fields of energy systems engineering.

**Learning Outcomes:**

1. A strong foundation in the theoretical principles and techniques from science, engineering, and mathematics needed for advanced engineering design and development.
2. An ability to use modern engineering software, processes, devices, and diagnostic tools for advanced engineering design and development.

**Requirements**

All ESE students are required to take three core courses (9 credit hours):

- ESE 500 Sustainable Energy Systems
- ESE 501 or 502 Energy Conversion / Energy Storage
- ECE 542 Introduction to Power Management and Reliability

**Elective Courses (21 credit hours)**

Select any 7 courses from the following list.

Additional elective courses from other units in UM-D may also be considered with the ESE program director’s approval. Thesis option may be elected with the approval of the graduate program director. It will count for six (6) credit hours of graduate coursework replacing two courses in the Elective area and will extend at least two terms.

**Automotive Concentration**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AENG 547</td>
<td>Automotive Powertrains I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 588</td>
<td>Design &amp; Manufacture for Environment</td>
<td>3</td>
</tr>
<tr>
<td>AENG 596</td>
<td>Internal Combustion Engines I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 598</td>
<td>Energy Sys for Auto Vehicles</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5462</td>
<td>Elec Aspects of Hybrid Vehicle</td>
<td>3</td>
</tr>
<tr>
<td>ECE 646</td>
<td>Adv Elec Drive Transportation</td>
<td>3</td>
</tr>
<tr>
<td>ME 548</td>
<td>Automotive Powertrains II</td>
<td>3</td>
</tr>
<tr>
<td>ME 597</td>
<td>Internal Combustion Engines II</td>
<td>3</td>
</tr>
<tr>
<td>ME 598</td>
<td>Engine Emissions</td>
<td>3</td>
</tr>
</tbody>
</table>
### Electric Power Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 517</td>
<td>Adv Pwr Electrncs&amp;Motor Drvs</td>
<td>3</td>
</tr>
<tr>
<td>ECE 519</td>
<td>Adv Topics in EMC</td>
<td>3</td>
</tr>
<tr>
<td>ECE 615</td>
<td>Advanced Power Electronics</td>
<td>3</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 512</td>
<td>Structural Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 514</td>
<td>Advanced Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 522</td>
<td>Advanced Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 525</td>
<td>Computational Thermo-Fluids</td>
<td>3</td>
</tr>
<tr>
<td>ME 528</td>
<td>Fund of Boiling and Condensatn</td>
<td>3</td>
</tr>
<tr>
<td>ME 532</td>
<td>Combustion Processes</td>
<td>3</td>
</tr>
<tr>
<td>ME 535</td>
<td>Advanced Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 558</td>
<td>Fracture and Fatig Cons in Des</td>
<td>3</td>
</tr>
<tr>
<td>ME 571</td>
<td>Conduction Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ME 572</td>
<td>Convection Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ME 591</td>
<td>Degradation of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 565</td>
<td>Digital Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 580</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 665</td>
<td>Optimal Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 505</td>
<td>Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ESE 503</td>
<td>Energy Policy, Econ &amp; Environ</td>
<td>3</td>
</tr>
<tr>
<td>ESE 504</td>
<td>Energy Eval/Risk&amp;Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5205</td>
<td>Eng Risk-Benefit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt and Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

### Advanced Standing

Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution. Students may transfer up to one-half (1/2) the minimum number of credit hours required for their master’s or professional degree from U-M/non-Rackham departments and programs (including Dearborn and Flint).

### Degree Requirements

The Master of Science in Engineering Management requires a minimum of 36 graduate credit hours.

Minimum Grade Requirement in addition to maintaining a minimum cumulative GPA of 3.0 or higher every semester:
1. Courses in which grades of C- or below are earned cannot be used to fulfill degree requirements.
2. No more than two courses in which grades of B- or below are earned can be used to fulfill degree requirements.

A minimum of a 3.0 cumulative GPA or higher is required at the time of graduation.

### Degree Requirements

The program of study must satisfy the following distribution and course requirements:

1. **Engineering Management core courses, 18 credit hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMGT 500</td>
<td>Management for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 505</td>
<td>Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 520</td>
<td>Prod &amp; Oper Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 525</td>
<td>Tot Qua Mgmt and Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 570</td>
<td>Enterprise Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 580</td>
<td>Mgt of Prod and Proc Design</td>
<td>3</td>
</tr>
</tbody>
</table>

2. **Business requirements, 12 credit hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>3</td>
</tr>
<tr>
<td>Choose 3 courses from the list below:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BE 530</td>
<td>Econ Analysis: Firm &amp; Consumer</td>
<td>3</td>
</tr>
<tr>
<td>FIN 531</td>
<td>Fin Fundament &amp; Value Creation</td>
<td>3</td>
</tr>
<tr>
<td>HRM 561</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

3. **Capstone Project, 2 credit hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMGT 591</td>
<td>Capstone Project in EMGT</td>
<td>2</td>
</tr>
</tbody>
</table>

4. **Electives, 3 credit hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved Electives, take one class from the list below:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMSE 501</td>
<td>Human Factors &amp; Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 505</td>
<td>Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 511</td>
<td>Design and Analysis of Exp</td>
<td>3</td>
</tr>
</tbody>
</table>

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**Engineering Management**

This degree program is available both on campus and via the Internet.

**Admission**

Admission to the program as a regular student requires a BS degree in engineering, or a degree in math, computer science, or a physical science earned from an accredited program with an average of B or better coupled with extensive experience in engineering. Each applicant will be required to present official, complete transcripts of prior college work. Two letters of recommendation are required for admission. At least one letter must be from someone familiar with the candidate’s academic performance. An entering student should have completed one course in probability and statistics. Deficiencies in prerequisites may be made up after entrance to the Graduate School; however, credits received in courses elected to make up the deficiencies do not count toward the degree.
Human Centered Design and Engineering

About the Program
MS in HCDE is a 31 semester hours graduate degree designed for students who want to pursue leadership roles in user experience research and design and/or explore, extend, and integrate theoretical and practical issues in design using human centered approach. The proposed program also addresses strong need in industry for highly qualified individuals who can research, identify, document and translate user requirements and needs, generate creative ideas, implement and evaluate the products or services in a scientific way.

MS in HCDE is an interdisciplinary program offered by the Department of Industrial and Manufacturing Systems Engineering in the College of Engineering and Computer Science with the participation of the Department of Behavioral Sciences in the College of Arts, Science and Letters at the University of Michigan-Dearborn.

Human centered design related jobs are on the rise and appear under various titles, such as user experience designer, user interface designer, interaction designer, usability analyst, and product designer.

Program Goals
- Provide knowledge to research, explore, extend, and integrate theoretical and practical issues in design using human centered approach.
- Provide students with the ability to function in multidisciplinary teams and develop innovative solutions to real life design problems.
- Prepare students for the carrier opportunities in human centered/experience design.

Curriculum Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCDE 501</td>
<td>Human Factors and Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>HCDE 510</td>
<td>Foundation of HCDE</td>
<td>3</td>
</tr>
<tr>
<td>HCDE 520</td>
<td>Research Methods in HCDE</td>
<td>3</td>
</tr>
<tr>
<td>HCDE 590</td>
<td>Capstone Project I</td>
<td>2</td>
</tr>
<tr>
<td>HCDE 591</td>
<td>Capstone Project II</td>
<td>2</td>
</tr>
<tr>
<td>IMSE 577</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Requirements (9 credits)

A minimum of 9 credit hours form the two concentration areas (A) and (B) listed below. All three courses must be taken from one concentration.

A. User Experience Design:

Focuses on how to balance user's needs with business objectives and technology constraints.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCDE 530</td>
<td>Information Visualization</td>
<td>3</td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Certificate offered on Campus and via Distance Learning

Human Centered Design and Engineering

Game Design

The purpose of the certificate program in game design is to provide interested students with the theoretical knowledge and practical experience needed to program computer games at the professional level. The core courses included in this program are taught from a software engineering perspective and also include game programming techniques. The elective courses are intended to allow students to strengthen their software engineering backgrounds and to explore advanced areas of computer science important to game programmers. (12 credit hours)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 587</td>
<td>Computer Game Design and Impl</td>
<td>3</td>
</tr>
<tr>
<td>CIS 588</td>
<td>Computer Game Design II</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Coursework

Complete 2 courses from the following (6 credits):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 515</td>
<td>Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CIS 535</td>
<td>Wireless Tech/Pervasive Cmptg</td>
<td>3</td>
</tr>
<tr>
<td>CIS 552</td>
<td>Inf Vis &amp; Multimedia Gaming</td>
<td>3</td>
</tr>
<tr>
<td>CIS 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIS 577</td>
<td>S/W User Interface Dsgn&amp;Analys</td>
<td>3</td>
</tr>
<tr>
<td>CIS 579</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
</tbody>
</table>
Can enroll if Level is Rackham or Graduate

Restriction(s):

real life design problem. (F)

ideation, emotional design, product prototyping and testing. A semester

design solutions. Topics include empathy, defining design problem,

Students learn to apply the process and principles to generate innovative

This course introduces human-centered design principles and process.

Full Course Title: Foundation of Human-Centered Design and Engineering

Code Title Credit Hours
IMSE 545 Vehicle Ergonomics I 3
IMSE 548 Res.Meth.Human Fctrs/Ergonomic 3
IMSE 561 Tot Qual Mgmt and Six Sigma 3
IMSE 586 Big Data Aanal & Visuliztn 3
IMSE 593 Vehicle Package Engineering 3
EMGT 580 Mgt of Prod and Proc Design 3
AENG 589 Auto Assembly Systems 3
AENG 588 Design&Manufac for Environment 3
ME 581 Materials for Manufacturing 3
ME 588 Production of Mech Products 3
ME 595 Digital Manufacturing 3

Electives

The remaining 6 credit hours may be selected with the approval of the graduate advisor.

M.S. Thesis Option

With the approval of their graduate advisor, students may substitute a master's thesis (i.e., IMSE 699) for no more than seven credit hours of graduate course work. IMSE 699, Master's thesis will replace three credits of program electives, Capstone Project I and Capstone Project II requirements in the program.

HCDE 501 Human Factors and Ergonomics 3 Credit Hours
This course is designed to provide an understanding of ergonomics as a science and process, with an emphasis on people at work. Discussion of ergonomic methods for measurement, assessment, and evaluation, with major topics including manual materials handling, cumulative trauma disorders, environmental stresses, and safety issues. (FW)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 510 Foundation of HCDE 3 Credit Hours
Full Course Title: Foundation of Human-Centered Design and Engineering
This course introduces human-centered design principles and process.

Students learn to apply the process and principles to generate innovative
design solutions. Topics include empathy, deening design problem,
ideation, emotional design, product prototyping and testing. A semester
long team based project allows students to apply classroom learnings to
real life design problem. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 520 Research Methods in HCDE 3 Credit Hours
Full Course Title: Research Methods in Human-Centered Design and Engineering
This course surveys qualitative and quantitative research methods in human-centered design and engineering. Different data collection and measurement techniques are covered for different types of data, including subjective, behavioral, and physiological data. Human subject involved experiment design and introduction to basic statistics are also be covered in this course. Other topics include cognitive task analysis, physiological computing in emotional design and sentiment analysis in user needs elicitation process. Students learn to formulate research questions and hypotheses, design and conduct a research study, and present research results through various case studies. (W)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 530 Information Visualization 3 Credit Hours
This course introduces information visualization techniques and process which produce effective visualization and help people understand and analyze data. Topics include basics of information visualization, including its history and necessity, human aspects to understand how human perceives visual stimuli, considerations to present data, strategic techniques to summarize and display information, and evaluation of information design. (W)
Restriction(s):
Can enroll if Level is Rackham or Graduate

HCDE 590 Capstone Project I 2 Credit Hours
Students form project teams, develop capstone topics, initial concepts, deliverables, schedules and necessary pilot study for the HCDE capstone project. (F,W)
Prerequisite(s): HCDE 520 and IMSE 577 and HCDE 501
Restriction(s):
Can enroll if Level is Graduate
Can enroll if College is Engineering and Computer Science

HCDE 591 Capstone Project II 2 Credit Hours
Students, working in teams under the supervision of individual faculty members, integrate and apply knowledge acquired in various courses of the HCDE program to a design problem of their choosing. (F,W)
Prerequisite(s): HCDE 590
Restriction(s):
Can enroll if College is Engineering and Computer Science

Industrial and Systems Engineering

The Master's program in Industrial & Systems Engineering (ISE) is a 30 credit hour degree program designed for engineers and other professionals who have responsibility for designing, installing, improving and evaluating large integrated systems. Specializations/courses are available in the areas of:

- Human Factors/Ergonomics
- Operations Research & Management Science
- Quality Systems Design
- Advanced Manufacturing & Automation
- Information Systems Management
- Program Management & Product Development

The program may be completed entirely on campus, entirely online, or through a combination of on-campus and online courses.

The ISE Ph.D. program provides educational opportunities to talented students to acquire the advanced knowledge needed to become creative researchers as well as technical leaders and technology innovators in
industrial and systems engineering. The program is a full-time, research-based degree designed to address the growing needs of society for scientific and engineering professionals with advanced knowledge, technical skills, and abilities to conduct original and high-quality translational research in industrial and systems engineering. Students are admitted for full-time study and all admission offers are for the Fall term only.

Specific requirements of the program are described below.

This degree program is available both on campus and via the Internet.

Admission
Admission to the program as a regular student requires a BS degree in Engineering, a physical science, computer science, or applied mathematics earned from an accredited program with an average of B or better. Each applicant will be required to present a complete transcript of prior college work. An entering student should have already completed at least one course in probability and statistics and one course in operations research. Deficiencies in prerequisites may be made up after entering the graduate school; however, credits received in courses elected to make up the deficiencies do not count toward a degree. Students who have not fulfilled the requirements of the BS in Industrial and Systems Engineering should communicate with the program advisor regarding the requirements to be met.

Two letters of recommendation are required for admission. At least one letter of recommendation must be from the applicant’s undergraduate academic institution.

Degree Requirements
The degree MSE in I&SE requires a minimum of 30 credit hours. No comprehensive final examination is required.

Minimum Grade Requirement in addition to maintaining a minimum cumulative GPA of 3.0 or higher every semester:
1. Courses in which grades of C- or below are earned cannot be used to fulfill degree requirements.
2. No more than two courses in which grades of B- or below are earned can be used to fulfill degree requirements.

A minimum of a 3.0 cumulative GPA or higher is required at the time of graduation.

Advanced Standing Provision
Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution. Students may transfer up to one-half (1/2) the minimum number of credit hours required for their master’s or professional degree from U-M/non-Rackham departments and programs (including Dearborn and Flint).

Degree Requirements
The MSE in Industrial and Systems Engineering requires a minimum of 30 credit hours.

Specific Course Requirements
The program of study must satisfy the following distribution and course requirements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 511</td>
<td>Design and Analysis of Exp</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 501</td>
<td>Human Factors &amp; Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 580</td>
<td>Prod &amp; Oper Engineering I</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration
A minimum of 12 credit hours from the three concentration areas.
All four courses can be taken from one concentration area or any combination of the three concentration areas below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 501</td>
<td>Human Factors &amp; Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 503</td>
<td>Safety Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 548</td>
<td>Res.Meth.Human Fctrs/Ergonomic</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 577</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 593</td>
<td>Vehicle Package Engineering</td>
<td>3</td>
</tr>
<tr>
<td>AENG 546</td>
<td>Vehicle Ergonomics II</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 505</td>
<td>Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 514</td>
<td>Multivariate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5205</td>
<td>Eng Risk-Benefit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 559</td>
<td>System Simulation</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 605</td>
<td>Advanced Optimization</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 606</td>
<td>Advanced Stochastic Processes</td>
<td>3</td>
</tr>
</tbody>
</table>

Integrated Design and Manufacturing Engineering Concentration
Quality Systems Design:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 513</td>
<td>Robust Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 519</td>
<td>Quan Meth in Quality Engin</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt and Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Advanced Manufacturing & Automation:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 502</td>
<td>Computer-Integrated Mfg</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 538</td>
<td>Intelligent Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 581</td>
<td>Prod &amp; Oper Engineering II</td>
<td>3</td>
</tr>
</tbody>
</table>

Information Systems Concentration
Information Systems Management:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 557</td>
<td>Comp Networks and Comm</td>
<td>3</td>
</tr>
</tbody>
</table>

Enterprise Information Systems:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 555</td>
<td>Decision Support/Expert Sys</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5585</td>
<td>Electronic Commerce</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 564</td>
<td>Meth &amp; Tech in ERP Sys Develop</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 570</td>
<td>Enterprise Information Systems</td>
<td>3</td>
</tr>
</tbody>
</table>
At least two graduate-level cognate courses for a minimum of six credit hours each in departments other than IMSE must be elected. The remaining credit hours may be selected with the approval of the graduate advisor. With the approval of their graduate advisor, students may substitute a master's thesis for no more than six credit hours of graduate coursework. Students choosing the thesis option are required to elect a minimum of 9 credit hours from the concentration electives, rather than the 12 credit hours stipulated above for the concentration areas. Students must complete 2 of the courses from one of the concentration areas.

Dual Degree, MBA/MSE-Industrial Systems Engineering

The MBA/MSE-Industrial Systems Engineering has been carefully developed to meet the increasing need for professionals who have expertise in both engineering and management. It is open to students who have completed a Bachelor of Science degree in engineering, a physical science, computer science, or applied mathematics.

The program is offered jointly by the College of Business and the College of Engineering and Computer Science. It allows students to receive both the MBA and MSE-ISE simultaneously upon completion of the required 57-66 credit hours.

You may complete the program on campus, on-line, or any combination of the two, and you may enroll on a full- or part-time basis. Admission is rolling, and you may begin the program in September, January, or May. Students must apply and be admitted to the MBA and the MSE-ISE programs separately. University of Michigan-Dearborn students who have been admitted to the program may take up to 6 graduate business credits during the final semester of their undergraduate program.

Program Goals and Objectives

Master of Business Administration

Goal 1: Students will have an understanding of the core business disciplines and be able to apply this knowledge to global business situations.

Objectives: MBA students will:

1. Demonstrate knowledge of disciplinary concepts, terminology, models, and perspectives.
2. Identify business problems and apply appropriate solutions (problem-finding/problem-solving).

Goal 2: Students will be effective communicators.

Objectives: MBA students will:

1. Demonstrate an ability to effectively communicate in a manner that is typically required of a business professional.

Goal 3: Students will appreciate the importance of ethical/corporate social responsibility principles.

Objectives: MBA students will:

1. Identify and explain alternative approaches to ethical/corporate social responsibility issues.

Admission Prerequisites

Master of Business Administration

- Mathematics admission prerequisite
- GMAT/GRE admission prerequisite

MSE in Industrial and Systems Engineering

- Completion of a bachelor of science degree in engineering, a physical science, computer science, or applied mathematics
- A course in Probability and Statistics equivalent to IMSE 510
- A course in Operations Research equivalent to IMSE 500

Ph.D. in Industrial and Systems Engineering

The ISE Ph.D. degree requirements include a minimum of 18 credit hours of coursework (beyond Master's) and 24 credit hours of Ph.D. dissertation. The ISE Ph.D. is comprised of five major milestones, which all students are required to pass successfully prior to graduation:

1. Completion of the required coursework
2. Passing the Qualifying Examination on the core coursework
3. Filing an approved Plan of Study
4. Passing the Preliminary Examination and approval of the advancement to candidacy
5. Successful oral defense of an approved written dissertation

Course Requirements

The course curriculum consists of three required core courses (9 credit hours) and three concentration courses (9 credit hours) from the curriculum shown below. The course curriculum also requires a minimum of four credit hours of cognate coursework that may have been satisfied by the student’s Master’s Degree program.

Breadth requirement: The breath requirement is satisfied by student taking three core courses (9 credit hours) in the program.

Depth requirement: Student must select at least three courses (9 credit hours) from the same concentration area.
Cognate Requirements

The student can satisfy ISE Ph.D. program cognate requirement in one of the following ways:

1. Completion of at least four hours of approved cognate credits, which must be from outside the IMSE department. The minimum acceptable grade for a cognate course is a B.
2. Completion of a University of Michigan Master's degree, which included a cognate component. This coursework must be completed no more than 5 years before admission to the ISE Ph.D. Program.
3. Completion of a relevant Master's degree from another university which had a coursework that meets the expectation of the program cognate requirement. This coursework must be completed no more than 5 years before admission to the ISE Ph.D. Program.

Qualifying Examination

By the end of the third semester in the program, a student must pass a written qualifying examination to continue in the program. The Ph.D. Qualifying Examination Committee administers the exam. The Committee is selected by the ISE Ph.D. Program Committee, and consists of three IMSE faculty members and cannot include the research advisor. The purpose of the qualifying examination is to assist both the department and the student in determining whether a student can be expected to perform at a sufficiently high level in advanced course work and research to complete the requirements for the degree. The examinations are given twice a year, once in the fall and once in the winter. The qualifying examination is comprised of the following:

- By the end of the third semester in the program student must take one three-hour written qualifying examination covering the material in three core courses taken in the program. Each one-hour portion of the examination covers material from one of three core courses taken in the program: (1) Optimization (coverage of IMSE 505), (2) Applied Probability and Statistics (coverage of IMSE 514), (3) Production (coverage of IMSE 581), and (4) Ergonomics (coverage of IMSE 548).
- The decision to pass or fail a student is made on the basis of the student attaining a minimum requirement of 75% in each area of the written examination.
- A student who fails the qualifying examination, with the approval of the Ph.D. ISE Program Committee may be allowed only one reexamination, which must be taken at the next scheduled examination date.

Plan of Study

After successfully completing the core courses and passing the qualifying examination, a student is required to develop and submit a Plan of Study that meets at least the minimum requirements for the ISE Ph.D. degree. The student's advisor and the ISE Ph.D. Program Committee must approve the Plan of Study. All courses on the Plan of Study, including cognate courses, must be taken on a letter grade (A/F) basis. Audit courses cannot be included on the Plan of Study. The approved Plan of Study is kept in student's academic file. A student must file the approved Plan of Study by the end of the third academic semester in the program or immediately after passing the qualifying examination to continue in the program.

Preliminary Examination

The Preliminary Examination is an oral examination administered by a student's Dissertation Committee. The primary purpose of this examination is to test the student on his dissertation proposal to determine whether the research objectives are reasonable and achievable. The examination also provides an opportunity for the committee to determine if the student has enough knowledge to pursue research in the proposed subject area and to pass judgment on the suitability of the proposed research as a dissertation topic. The student must be registered for the semester in which he/she takes his/her preliminary examination. The student makes an oral presentation, which is prepared in consultation with the dissertation advisor, in defense of the dissertation proposal. The oral presentation is open to other interested faculty and students. The entire dissertation committee must be present during the preliminary examination. A majority vote by the committee and a pass vote by the committee chair are required to pass the examination.
Dissertation Committee

Soon after passing the Qualifying Examination but before the Preliminary Examination, the student and the research advisor form a Dissertation Committee. The research advisor is the chair of the student’s Dissertation Committee and works with the student to assemble a committee consisting of appropriate faculty regarding their experience and research interests. The dissertation committee includes a minimum of four faculty members. The chair or one of the co-chairs of the committee must be a member of the IMSE faculty. One of the members of the committee must be the cognate member. The cognate member must hold at least a .50 appointment in a graduate program, other than IMSE. Depending on the dissertation topic, other members, including a qualified industry member, may be added to the dissertation committee with the approval of the ISE Ph.D. Program Committee. The dissertation committee must be approved by the ISE Ph.D. Program Committee at least six-weeks before the preliminary examination date.

Advancement to Candidacy

Advancement to candidacy is a significant milestone on the way to the Ph.D. A ISE Ph.D. student should achieve candidacy within three years from the time of initial enrollment in the program. Other requirements to advance to candidacy are as follows:

- Completion of the coursework requirements of the program.
- Completion of the cognate requirement of the program.
- Passing of the Qualifying Examination.
- Submitting approved Plan of Study.
- Passing of the Preliminary Examination.
- Posting a minimum cumulative GPA 3.3 out of 4 at the time of applying for the candidacy.

A student should apply for candidacy as soon as he/she meets all the candidacy requirements. If it has been more than three years since the student started the program, a Petition for Modification or Waiver of Regulation asking for an extension for time to candidacy approved by the ISE Ph.D. Program Committee is required.

Dissertation and Dissertation Defense

After candidacy requirements are met the student may proceed with the dissertation research and writing of the dissertation. The dissertation should document the original contributions made by the candidate as a result of independent research. The research work should be of archival quality. In advance of graduation, the dissertation must be approved by all the members of the student’s dissertation committee. To obtain this approval a student must submit a written copy of the dissertation to the dissertation committee and defend the research work at a final oral examination open to other faculty, students, and interested public. Copies of the dissertation, approved by the research advisor, must be provided to the committee at least two weeks before the oral defense. The copies of the dissertation given to the committee should be in the final form and must be formatted to meet the standards of Academic Records and Dissertations. The dissertation committee members are required to submit written evaluation of the student’s dissertation prior to oral defense. The dissertation committee members must be present at the dissertation defense. Since the defense examination includes the formal public presentation of the dissertation research, it will be publicized throughout the college and the university. The time between passing the preliminary examination and the dissertation oral defense is at least 14 weeks.

Publication of Research

The ISE Ph.D. program is designed to give a student comprehensive and in-depth knowledge of the chosen professional field and training in research methods. Therefore, the student is required to prepare at least one paper based on his/her dissertation research for submission to a professional journal prior to scheduling the final oral examination.

Time Limit for Completing a Doctoral Degree

Students are expected to complete the degree within five years of achieving candidacy, but no more than seven years from the date of the first enrollment in the ISE Ph.D. program. Students who have not completed their degree within the seven-year limit may petition the ISE Ph.D. Program Committee for an extension of time to degree with a plan for completion. A student who does not complete the degree after two years of extension may be returned to pre-candidacy status and required to meet candidacy requirements again.

Cognate Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 505</td>
<td>Algorithm Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 536</td>
<td>Information Retrieval</td>
<td>3</td>
</tr>
<tr>
<td>CIS 550</td>
<td>Obj-Oriet Prog and Its Applic</td>
<td>3</td>
</tr>
<tr>
<td>CIS 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 571</td>
<td>Web Services</td>
<td>3</td>
</tr>
<tr>
<td>CIS 579</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CIS 652</td>
<td>Info Visualztn &amp; Comp Anim</td>
<td>3</td>
</tr>
<tr>
<td>ECE 535</td>
<td>Mob Dev &amp; Ubiqys Comp Sys</td>
<td>3</td>
</tr>
<tr>
<td>ECE 531</td>
<td>Intelligent Vehicle Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 537</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>ECE 542</td>
<td>Intr to Pwr Mgmt &amp; Reliability</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 579</td>
<td>Intelligent Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5831</td>
<td>Pat Rec &amp; Neural Netwks</td>
<td>3</td>
</tr>
<tr>
<td>ECE 644</td>
<td>Advanced Robotics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 679</td>
<td>Adv Intelligent Sys</td>
<td>3</td>
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</table>

Mechanical Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ME 560</td>
<td>Experimental Methods in Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 552</td>
<td>Sustainable Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ME 567</td>
<td>Reliability Consid in Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 580</td>
<td>Advanced Engineering Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 584</td>
<td>Mechanical Behavior of Polymer</td>
<td>3</td>
</tr>
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Mathematics and Statistics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 520</td>
<td>Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>MATH 525</td>
<td>Mathematical Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 562</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MATH 583</td>
<td>Discrete Optimization</td>
<td>3</td>
</tr>
<tr>
<td>MATH 584</td>
<td>Applied&amp;Algorithmic Graph Thy</td>
<td>3</td>
</tr>
<tr>
<td>MATH 592</td>
<td>Introduction to Topology</td>
<td>3</td>
</tr>
<tr>
<td>STAT 535</td>
<td>Data Analysis and Modeling</td>
<td>3</td>
</tr>
<tr>
<td>STAT 530</td>
<td>Applied Regression Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
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</tr>
</tbody>
</table>
IMSE 500    Models of Oper Research    3 Credit Hours
The method of mathematical modeling and its application to decision-making problems in organizations. Some widely used models and techniques: linear programming, queuing, inventory, and simulation.
Restriction(s):
Can enroll if Class is Graduate

IMSE 501    Human Factors & Ergonomics    3 Credit Hours
The analysis and prediction of human performance in industrial and other man-machine systems using work sampling, time-motion analysis, synthetic and standard time study, and learning curves, in the design of such systems. Lecture and laboratory. Cannot receive credit for both IMSE 442, and IMSE 501. This class may be scheduled at the same time as the undergraduate course IMSE 442. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 317* or IMSE 510*
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 5010    Fundamentals of Program Mgt    3 Credit Hours
An overview of the project/program management framework and knowledge areas including plan development and execution; management of scope, time, cost, quality, human resource, communications, risk, and procurement. Typical program phases and life cycles observed in defense, construction, automobile, and software industries. Program organizational structures, program management processes, international project management, role of software tools for program management, product development, applications of Lean Product Development techniques, cutting waste and lead time in program management.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Business

IMSE 502    Computer-Integrated Mfg    3 Credit Hours
This course provides basic knowledge of elements in Computer-Integrated Manufacturing Systems, with particular emphasis on Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Computer-Aided Process Planning (CAPP), materials handling, and information flow in manufacturing systems. Hands-on experiments and course projects are required. Two lecture hours and three laboratory hours. Credit cannot be given for both IMSE 483 and IMSE 502. This class may be scheduled at the same time as the undergraduate course IMSE 483. Graduate students will be required to do additional research paper and/or project.
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 503    Computer-Aided M/C & Tool Desg    3 Credit Hours
Study of the fundamentals of machine tool design, cutting tools, metal forming dies, and jig fixtures for practical applications in machining and assembly. Principles of design for manufacture and assembly as applied to tool and machine design. Laboratory exercise and projects are required using computer-aided design software. Two lecture hours and three laboratory hours. Credit cannot be given for both IMSE 484 and IMSE 503. This class may be scheduled at the same time as the undergraduate course IMSE 484. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 382 or ME 381
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 504    Metal Forming Processes    3 Credit Hours
This course focus is on fundamentals of metal forming processes; mechanics of metal forming; formability of manufacture; and economic aspect of the process. Emphasis is placed on analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Laboratory and course project are required. Credit cannot be given for both IMSE 488 and IMSE 504. This class may be scheduled at the same time as the undergraduate course IMSE 488. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 382 or IMSE 381
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 505    Optimization    3 Credit Hours
Prerequisite(s): IMSE 300 or IMSE 500

IMSE 508    Modeling of Large-Scale Sys    3 Credit Hours
The modern and classical concepts and tools required for modeling, analysis and synthesis of large-scale dynamic systems. Topics include system dynamics, interpretive structural modeling, cross-impact analysis, information theory, theory of hierarchical systems. Emphasis is on constructing models of real world problems taken from urban, industrial, transportation, and health care systems. Students are asked to select problems of interest and present final project reports.
Prerequisite(s): IMSE 505 and IMSE 506

IMSE 510    Probability & Statistical Mod    3 Credit Hours
Prerequisite(s): IMSE 317

IMSE 511    Design and Analysis of Exp    3 Credit Hours
One factor, two factor, and multifactor experiments. Fixed random and mixed models. Blocked confounding, incomplete blocks, factorial experiments, fractional factorial experiments. Introduction to response surface analysis.
Prerequisite(s): IMSE 510

PSYC 530    Psychology in the Workplace    3
PSYC 548    Psychological Assessment I    4
PSYC 563    Sensation and Perception    3
PSYC 561    Learning and Memory    3
PSYC 565    Ind&Grp Tech in Cln Hlth Psyc    3

IMSE 500    Models of Oper Research    3 Credit Hours
IMSE 501    Human Factors & Ergonomics    3 Credit Hours
IMSE 5010    Fundamentals of Program Mgt    3 Credit Hours
IMSE 502    Computer-Integrated Mfg    3 Credit Hours
IMSE 503    Computer-Aided M/C & Tool Desg    3 Credit Hours
IMSE 504    Metal Forming Processes    3 Credit Hours
IMSE 505    Optimization    3 Credit Hours
IMSE 508    Modeling of Large-Scale Sys    3 Credit Hours
IMSE 510    Probability & Statistical Mod    3 Credit Hours
IMSE 511    Design and Analysis of Exp    3 Credit Hours
IMSE 510   Taguchi Method of Quality Eng   3 Credit Hours
Quality engineering methodology developed by Genichi Taguchi. Design
and analysis of experiments using orthogonal arrays and linear graphs.
Accumulation analysis for categorized data. Signal-to-noise ratio as a
measure of quality characteristics. Simulation using orthogonal arrays.
Parameter design for reducing variability around the target without cost
increase. Tolerance design for reducing variability with minimum cost
increase. Evaluation and improvement of measurement.
Prerequisite(s): IMSE 510

IMSE 514   Multivariate Statistics   3 Credit Hours
Linear statistical models used in simple and multiple regression, and
analysis of variation. Principles and techniques of principle component
analysis are studied and applied to business and engineering problems
using statistical computer software. (YR)
Prerequisite(s): IMSE 510

IMSE 515   Fundamentals of Program Mgt   3 Credit Hours
An overview of the project/program management framework
and knowledge areas including plan development and execution,
scope management, time management, cost management, quality
management, human resource management, communications
management, risk management, and procurement management. Typical
Program Phases and Life Cycles observed in Defense, Construction,
Automobile, and Software Industries. Program Organizational Structures,
Program Management Processes, and International Project Management
are covered. Role of software tools for Program Management and
Product Development are discussed. Applications of Lean Product
Development Techniques are considered. Cutting waste and lead time
in program management are covered. Case studies are used extensively
throughout the course.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

IMSE 516   Project Management and Control   3 Credit Hours
Project Planning, Scheduling, and Controlling functions are discussed in
detail including work breakdown structure, CPM and PERT methods,
resource allocation and leveling techniques, cost control and
minimization, trade-off analysis, learning curves overlapping relationships
and concurrent engineering, multiple project execution and optimization.
Applications of Lean Techniques in program management are discussed
as well as the role of IT in accelerating the product development and
reducing the program time. The importance of integrating the Supply
Chain in the Product Development is also considered. Case studies and
project management software are used throughout the course.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

IMSE 517   Managing Global Programs   3 Credit Hours
This course focuses on some of the central strategic and organizational
problems that arise in managing global programs, including cultural
conflicts, developing and managing international managers, global and
local brands, and organizing to resolve global-local conflicts. The course
uses a combination of case studies, problems, lectures and discussion,
over a wide variety of companies and countries.
Prerequisite(s): IMSE 515
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

IMSE 519   Quan Meth in Quality Engin   3 Credit Hours
This course introduces the advanced quantitative and analytical methods
used in quality measurement, prediction, control and improvement. The
topics include sampling design and plan, control charts, statistical quality
control, time series, process capability analysis and quality cost analysis.
Quality related topics in robust and tolerance design are also included.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 520   Managerial Decision Analysis   3 Credit Hours
Normative decision analysis, decisions, structures, and trees. Utility
theory, game theory, and statistical decision theory are introduced.
Applications of the theories to management studies in capital
investment, bidding, purchasing, and risk analysis are discussed.
Prerequisite(s): IMSE 510

IMSE 521   Mfg Cost Estimation & Control   3 Credit Hours
In this course, concepts of strategic costing in product development
and manufacturing are introduced. Engineering economy techniques
are used in the study of life cycle cost elements. Equipment acquisition
and manufacturing are introduced. Engineering economy techniques
over a wide variety of companies and countries.
uses a combination of case studies, problems, lectures and discussion,
over a wide variety of companies and countries.

IMSE 5215   Program Budget, Cost Est & Con   3 Credit Hours
This course focuses on cost estimation and control for program
managers and engineers. The course introduces a systematic approach
for applying engineering economy techniques in cost estimating,
resource planning, cost planning, cost management and control, and the
study of life cycle cost elements. An introduction to decisions under risk
and uncertainty as well as an introduction to project crashing are also
presented.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate

IMSE 5205   Eng Risk-Benefit Analysis   3 Credit Hours
Analysis risk assessment, decision and cost-benefit analysis, and fault-
tree methods for describing and making decisions about societal risks
associated with large engineering projects. Balancing risks and benefits
in situations involving human safety, environmental risks, and financial
uncertainties. Presentations of major risk assessment and the public
decision process associated with them.
Prerequisite(s): IMSE 510

IMSE 530   Procurement Mgt   3 Credit Hours
This course introduces the advanced quantitative and analytical methods
used in quality measurement, prediction, control and improvement. The
topics include sampling design and plan, control charts, statistical quality
control, time series, process capability analysis and quality cost analysis.
This course introduces the advanced quantitative and analytical methods
used in quality measurement, prediction, control and improvement. The
topics include sampling design and plan, control charts, statistical quality
control, time series, process capability analysis and quality cost analysis.

IMSE 535   Operations Research   3 Credit Hours
Project planning, scheduling, and controlling are discussed in
detail including work breakdown structure, CPM and PERT methods,
resource allocation and leveling techniques, cost control and
minimization, trade-off analysis, learning curves overlapping relationships
and concurrent engineering, multiple project execution and optimization.
Applications of Lean Techniques in program management are discussed
as well as the role of IT in accelerating the product development and
reducing the program time. The importance of integrating the Supply
Chain in the Product Development is also considered. Case studies and
project management software are used throughout the course.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development
IMSE 525  Fin & Econ Software Appl  1 Credit Hour
This course applies concepts and techniques of financial management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 510
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 526  Marketing Software Application  1 Credit Hour
This course applies concepts and techniques of marketing management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 535
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5275  Managerial Acct Software Appl  1 Credit Hour
This course applies concepts and techniques of managerial accounting to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 540
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5285  Human Resource Software Appl  1 Credit Hour
This course applies concepts and techniques of human resource management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 545
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 532  Information for Manufacturing  3 Credit Hours
Acquiring and organizing design and manufacturing information (including geometric modeling, group technology, and automated data acquisition), identifying kinds needed, sources, and recipients. Ensuring information quality; establishing criteria for selecting processing modes and media. Designing, installing, commissioning, and operating information-handling systems. Handling information in production systems.
Prerequisite(s): (ECE 539 or ME 588) and IMSE 530
Restriction(s):
Can enroll if Class is Graduate

IMSE 533  Manufacturing Systems  3 Credit Hours
This course introduces methodologies and tools for modeling, design and operations planning of manufacturing systems. Topics include introduction to integrated manufacturing systems, manufacturing system and data modeling methodologies, process planning, group technology, manufacturing system layout, scheduling, push and pull production systems. Industrial case studies are presented and discussed.
Restriction(s):
Can enroll if Class is Graduate

IMSE 534  Human Performance Engin in Mfg  3 Credit Hours
The human as a systems component in an information processing context emphasizing capabilities and limitations. The roles of sensing, perception, decision making, short term memory, long term memory, motivation, expectations and attention. An overview of Learning Organization concepts emphasizing personal mastery, mental models, and team learning. A strategy for design of the user-system interface. Analysis methods including functional analysis, traditional and object-oriented task analysis, and cognitive walk-through. Team design project and individual exercises. Emphasis on experiential learning.
Prerequisite(s): IMSE 530
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

IMSE 536  Machinery Diagnostics  3 Credit Hours
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate

IMSE 537  Metal Machining Processes  3 Credit Hours
Detailed study of the principles of conventional and non-traditional metal removing processes, machine tools accuracy, cutting fluids, and cutting tools. The course emphasis will be on the mechanics of metal cutting, machining processes, cutting tool materials and tool geometry, selection of cutting conditions, planning for machining and optimization of manufacturing process. Role of numerical control in improving machining process and productivity of manufacturing system.
Prerequisite(s): ME 381 or IMSE 382 or AENG 587

IMSE 538  Intelligent Manufacturing  3 Credit Hours
A comprehensive and integrated approach to topics associated with the science of artificial intelligence and their role in today's manufacturing environments. Design and management issues including information systems in an automated and integrated manufacturing environment.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Class is Graduate

IMSE 543  Industrial Ergonomics  3 Credit Hours
Effective ergonomic interventions in industrial environment enhance productivity, safety and job satisfaction. This course introduces engineers and engineering students how to apply ergonomic principles in designing industrial and manufacturing operations in which people play a significant role, so that human capabilities are maximized, physical fatigue is minimized, and performance is optimized. Case studies and topics emphasize industrial applications.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
IMSE 544  Industrial Biomechanics  3 Credit Hours
This course introduces the mechanical behavior of the musculoskeletal systems as related to physical work activities. Fundamentals of human body mechanics (Kinetic and Kinematic aspects of locomotion, body link systems, muscle strength and performance), muscle fatigue and musculoskeletal injury mechanism are covered with application to design of physical work activities and equipment. (YR).
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 545  Vehicle Ergonomics I  3 Credit Hours
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate

IMSE 546  Safety Engineering  3 Credit Hours
Safety requirements for production processes, equipment, and plants; organization and administration of safety programs, current safety laws, current occupational safety research.
Prerequisite(s): IMSE 442

IMSE 548  Res.Meth.Human Fctrs/Ergonomic  3 Credit Hours
Full Course Title: Research Methods in Human Factors and Ergonomics
This course covers principals and guidelines of Human Factors and Ergonomics (HFE) practices applied to complex human machine systems. The emphasis is on understanding advanced HFE assessment and surveillance methods in describing and quantifying human-machine-environment interaction. Key topics include, human modeling and simulation, information processing and related motor behavior, and ergonomics design and evaluation tools.
Prerequisite(s): IMSE 442

IMSE 549  Product Design and Evaluation  3 Credit Hours
Design approaches and processes used in developing customer/user-oriented products. Study of widely used product evaluation techniques: methods of observation, communication and experimenttion; subjective (e.g., psychological scaling) and objective measurement methods. Review of product design and evaluation case studies. Laboratory projects to evaluate several products.
Prerequisite(s): IMSE 442

IMSE 550  Data Management  3 Credit Hours
Topics in computer organization; principle data structures (stacks, trees, linked lists) and their use; searching and sorting; algorithm specification, and recursion. Programming assignments will deal with applications of these subjects.

IMSE 551  Compiler Construction  3 Credit Hours
The design and construction of compilers and programming systems. Lexical scan; parsing techniques; code generation and optimization; storage allocation. Applications of formal language theory in compiler design. Translator writing systems; XPL.
Prerequisite(s): IMSE 550

IMSE 552  Design/Analysis of Algorithms  3 Credit Hours
Design, evaluation, and communication of algorithms for solving problems using a digital computer. Topics include problem-solving approaches, algorithm notation, determination of algorithm correctness, measures of efficiency, improvement of algorithms. Examples and homework in designing algorithms for data processing, scheduling, combinatorial optimization, and elementary computer graphics, and numerical analysis.
Prerequisite(s): IMSE 550

IMSE 553  Software Engineering  3 Credit Hours
Program design methodologies; control flow and data flow in programs; program measurement. Software life cycle; large program design, development, testing, and maintenance. Software reliability and fault-tolerance. Evolution dynamics of software.
Prerequisite(s): IMSE 550

IMSE 554  Management Info Systems  3 Credit Hours
Basic systems concepts, role of a system analyst in an information system, systems investigation, feasibility study, output/input design, hardware/software evaluation and selection, system design, security considerations, systems implementation, information systems documentation, systems projects estimation and control. Students will be asked to develop a complete information system from case studies.
Prerequisite(s): IMSE 454

IMSE 555  Decision Support/Expert Sys  3 Credit Hours
Decision support process and decision support systems, development tools, executive support systems, expert systems and their development processes, expert shells, integration of decision support and expert systems.
Prerequisite(s): IMSE 350

IMSE 556  Database Systems  3 Credit Hours
Data structures and file processing; GUIDE and CODASYL reports; comparisons among the database management systems, relational, hierarchical, and network approaches; system design guidelines; DDL and Schema/Subschema; DML and Query language.

IMSE 557  Comp Networks and Comm  3 Credit Hours
To study the nature of communicating and distributing processing techniques, compare networking options, introduce specific business applications that require data communication and networks, and examine the role of communication software in the system, and discuss the related management issues.
Prerequisite(s): IMSE 454

IMSE 5585  Electronic Commerce  3 Credit Hours
This course examines how new information technologies and networks affect the exchange of goods and services between buyers and sellers in firms. What are economics of different electronic commerce models for firms? The course combines critical evaluation of business strategies with hands-on experience in building supporting electronic commerce systems utilizing electronic data interchange (EDI) software. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 559  System Simulation  3 Credit Hours
The modeling and simulation of discrete-change, continuous-change and combined-change stochastic systems. Conducting simulation studies using contemporary software such as SLAM II or random number generation, distribution sampling, and output analysis. Comparisons with analytical queuing models.
Prerequisite(s): IMSE 510
IMSE 561  Tot Qual Mgmt and Six Sigma  3 Credit Hours
This course covers implementing Total Quality Management (TQM), undertaking Six Sigma Projects, and applying Baldrige National Quality Award criteria and ISO 9000 principles to improve quality performances in an organization. Topics include Definitions and Importance of Quality, Quality Costs, Quality Function Deployment (QFD), Product Specification and Critical-to-quality Measures (CQM), Statistical Quality Control (SQC), Robustness Concepts, Quality System Design and Evaluation. Six Sigma and DMAIC Methodologies, Design for Six Sigma (DFSS) process, IDOV (Identity requirements, Design alternatives, Optimize the design and Verify process capability) Methodology, and several other concepts and tools related to quality are also covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate

IMSE 564  Meth & Tech in ERP Sys Develop  3 Credit Hours
Students will explore different technology tools and methodologies for building/customizing applications in ERP systems to meet business needs of an Enterprise. Extensive software design and development activities will be covered using modular/Object Oriented Programming, Data Modeling, Data Dictionary, Database Access, User Interface, Dialogue Programming, Interactive Report Design using appropriate tools such as, ABAP Workbench, SAP HANA Native Application Development, and SAP Project Implementation phases.
Prerequisite(s): IMSE 570 and (IMSE 556 or CIS 556)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5655  Supply Chain Management  3 Credit Hours
This course will address theories, concepts, models, methodologies and techniques for managing a supply chain. Topics include supply chain strategy, drivers and metrics of performance, designing global and regional supply chain networks using optimization models, planning demand and supply in a supply chain using forecasting, aggregate planning, and inventory optimization models, designing the transportation systems, pricing, and employing IT systems effectively in supply chains.
Prerequisite(s): IMSE 500 and IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 567  Reliability Analysis  3 Credit Hours
Statistics of reliability and life testing. Application of stochastic models for failure based on Poisson and related processes. Use of exponential and extreme value distribution in reliability. Use of Markov process in the areas of equipment reliability, maintenance and availability.
Prerequisite(s): IMSE 510

IMSE 569  Sys Simulation in Auto Engin  3 Credit Hours
The modeling and simulation of discrete, continuous and combined change stochastic systems. Conducting simulation studies using contemporary software such as ARENA and WITNESS. Topics in simulation methodology include random number generation, distribution sampling, input and output analysis. Integration techniques for continuous simulation, application to design of manufacturing and automotive systems.
Prerequisite(s): IMSE 510

IMSE 570  Enterprise Information Systems  3 Credit Hours
The purpose of this course is to provide a foundation for the analysis, design and implementation of enterprise information systems. Topics include systems and organization theories, and information systems planning and evaluation. Students will be also introduced to various systems development life cycle phases of an enterprise information system. Students will acquire an understanding of the flow of information (forecasts, financial, accounting and operational data) within an enterprise and the factors that should be considered in designing an integrated enterprise information system. This includes all systems in the business cycle from revenue forecasts, production planning, inventory management, logistics, manufacturing, accounts payable, sales, accounts receivable, payroll, general ledger and report generation. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5715  Modeling of Int Info Syst  3 Credit Hours
A review of approaches for modeling of integrated information systems. ARIS architecture. Data, control, function, and organization views of an information system. Requirements definition, design specification, and implementation definition of the different views. Process chain diagrams. Management of ERP projects. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5725  Object Oriented System Design  3 Credit Hours
Students will be introduced to fundamental concepts and methods of object oriented design and development. Topics that will be covered include object oriented database concepts, data models, schema design (conceptual schemas and physical schemas), query languages, physical storage of objects and indexes on objects, version management, schema evolution and systems issues such as concurrent control and recovery from failure. For application programming, a programming language such as C++ will be used for database design and query language. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 574  IS Based Prod Planning & Cont  3 Credit Hours
Students will be introduced to theories, models, methods and techniques in demand forecasting, inventory management, capacity planning, production scheduling and management components, in production planning and control for an enterprise. Application systems to model information sharing between these components will be developed using ERP software such as the SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 510 and IMSE 570 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate
IMSE 5755  Bus Proc Int using Entrpr Tech  3 Credit Hours
Full Title: Business Process Integration using Enterprise Technology
This course introduces the concept of integration, optimization and configuration of strategic business processes across the enterprise using ERP software technology. Use cases and specifications for some of these systems are introduced in different functional areas, such as Finance, Human Capital Management, Logistics, and Project Systems utilizing ERP software. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

IMSE 577  Human-Computer Interaction  3 Credit Hours
Full Course Title: Human-Computer Interaction for UI and UX Design - This course introduces current theory and design techniques concerning how user interfaces (UI) and user experience (UX) should be designed and assessed to be easy to learn and use. Course includes flowing general modules introduction of HCI & UX, Interface/Interaction design strategy; Advanced Issues in HCl; and Evaluation methods.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 579  Software Int Mfg & Logis Mgmt  3 Credit Hours
Students will be introduced to theories, models and techniques in manufacturing, logistics components and their interaction within an enterprise. Topics that will be covered include production/shop order analysis and management, capacity planning, and materials planning and inventory management. Application systems to model information sharing between these components will be developed using ERP software such as the SAP R/3 application development suite. (YR).
Prerequisite(s): IMSE 510 and IMSE 570 and (IMSE 571 or IMSE 5715)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 580  Prod & Oper Engineering I  3 Credit Hours
Production and operations management techniques including forecasting, inventory control, MRP, detailed scheduling, aggregate planning, process variability and its effects on throughput and inventory, factory physics principles, and lean methods.
Prerequisite(s): IMSE 510

IMSE 581  Prod & Oper Engineering II  3 Credit Hours
This course addresses the advanced theory and techniques of production and inventory systems. Topics include advanced forecasting methods, production scheduling and lot-sizing, stochastic single-and multi-item inventory systems, and service operations. This course also includes discussions of research articles on production and inventory systems.
Prerequisite(s): IMSE 580 or EMGT 520

IMSE 5825  Industrial Controls  3 Credit Hours
This course introduces the principle aspects of computers and their applications in systems control, principles of automation, with emphasis on manufacturing industries. Discussion on the hardware and software associated with this task and other topics such as integrated systems modeling, sensor technologies, digital and analog signal processing and control, and information communication are also included. Laboratory exercises and projects are required. Credit cannot be given for both IMSE 482 and IMSE 5825. This class may be scheduled at the same time as the undergraduate course IMSE 482. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): ECE 305
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 583  Concurrent Design &Manufacture  3 Credit Hours
This course will cover topics in manufacturing design and analysis with emphasis on the parallel design of product and processes. Topics include principles of design theory, concurrent engineering, group technology, cost estimating, assembly systems, and design for assembly and manufacture. Design projects using computer tools are required on a team-oriented basis.
Prerequisite(s): IMSE 382

IMSE 584  Logistical Systems  3 Credit Hours
Introduction to concepts of physical distribution and logistics management. Quantitative treatment of topics in materials management, transportation, forecasting, warehouse location. Logistical system design techniques which synthesize the above topics in order to design a fundamental system.
Prerequisite(s): IMSE 580

IMSE 585  Material Handling Systems  3 Credit Hours
Studies of material handling methods and equipment, study of techniques used in the analysis and design of material handling systems, study of storage and warehousing systems.
Prerequisite(s): IMSE 500

IMSE 586  Big Data Anal & Visuliztn  3 Credit Hours
Topics covered include Big Data's role in engineering, Data Visualization and Infographics Design Principles, Univariate, Bivariate and Multivariate Data Visualization, Visualization Groups, Clustering Distance Measures, Hierarchical, Partition-Based and Fuzzy Clustering, Predictive Analytics using Principal Component Analysis, Multivariate Linear Regression, Discriminant Analysis, and Logistic Regression. Software Tools and Techniques for Visualization and Data Analytics such as Tableau, SAS VA, Pentaho and R. (F)
Prerequisite(s): IMSE 510
Corequisite(s): IMSE 510

IMSE 587  Facilities Planning  3 Credit Hours
Analysis, planning and design of physical facilities utilizing operations research, engineering and economic principles. Synthesis of physical plant equipment and man into an integrated system for either service or manufacturing activities. Design of material handling systems. Students are required to select problems of interest and present design project reports. Credit may not be given for both IMSE 474 and IMSE 587. This class may be scheduled at the same time as the undergraduate course IMSE 474. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 500

IMSE 588  Bldg High Perf Learning Org  3 Credit Hours
The purpose of this course is to develop students’ knowledge and skills to explore and experience how the disciplines of systems thinking, personal mastery, mental models, team learning and shared vision impact on organizational learning and influence management practices for building highly performing organizations.

IMSE 590  Grad Study in Sel Topics I  1 to 3 Credit Hours
Individual or group of selected topics in industrial and systems engineering.
Restriction(s):
Can enroll if Class is Graduate

IMSE 591  Grad Study in Sel Topics II  1 to 3 Credit Hours
Continuation of IMSE 590.
Restriction(s):
Can enroll if Class is Graduate
IMSE 593  Vehicle Package Engineering  3 Credit Hours
Vehicle package specifications related to exterior and interior design reference points, dimensions and curb loadings. Benchmarking package studies, ergonomic tools and design practices used in the automobile industry. Driver positioning considerations; seat height, heel points, hip points, steering wheel location, seat pan, and back angles. Pedal design issues, gear shift positioning. Visibility of instrument panel space. Armrest and console design considerations. Principles and considerations in selecting and location types and characteristics of controls and displays on instrument panels, doors, consoles, and headers. Engine compartment packaging issues. Perception of interior spaciousness and visibility of the road over cowl and hood.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate

IMSE 600  Research in IMSE  1 to 3 Credit Hours
Individual or group study or research in a field of interest to the student. Topics may be chosen from any of the areas of industrial and systems engineering. The student will submit a project report and give an oral presentation at the close of the term.
Restriction(s):
Can enroll if Class is Graduate

IMSE 605  Advanced Optimization  3 Credit Hours
This course will cover selected advanced optimization methods for engineering disciplines and information systems. Topics include nonlinear programming, network optimization, dynamic programming and optimal control. Theories related to optimality and convergence, population-based optimization, etc. will be covered. Students will be expected to write computer program code to implement optimization methodologies.
Prerequisite(s): IMSE 500
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 606  Advanced Stochastic Processes  3 Credit Hours
This course introduces the theory and applications of discrete and continuous stochastic processes and models. The topics include Poisson process, renewal theory, discrete-time and continuous-time Markov chains, martingales, random walks, and Brownian motion. Other Markov processes with applications to queuing, simulation, and operations research in manufacturing and service systems will also be covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 610  Adv Top Enterprise Info Sys  3 Credit Hours
This course introduces advanced topics in the development, management and improvement of information systems in the context of supporting large enterprises. It covers emerging issues and solutions in modeling, IT infrastructure and technologies, critical enterprise functions, knowledge engineering, security and governance of enterprise information systems. It focuses on the changing requirements posed by the dynamics of their residing environment and information technology.
Prerequisite(s): IMSE 5715
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 659  Advanced System Simulation  3 Credit Hours
Simulation with animation packages using contemporary software such as SIMAN/CINEMA or SLAM/TESS. Topics in simulation methodology: random number generation and testing, distribution sampling, validation are reviewed. Emphasis on output analysis, design of simulation experiments, variance reduction techniques, expert systems in simulation.
Prerequisite(s): IMSE 459 and IMSE 559

IMSE 682  Seminar in Comp Proc Contl  3 Credit Hours
Advanced treatment of the design of process control systems with emphasis on the modeling of a process control and the design and analysis of a control strategy. Each student is expected to select a project and design and program the control strategy or support software on a mini-computer.
Prerequisite(s): IMSE 582

IMSE 699  Master's Thesis Project  1 to 6 Credit Hours
Full Title: Master's thesis project Thesis research by a candidate student of the Ph.D. in Industrial and Systems Engineering (I&SE) Program conducted under guidance of the faculty advisor. The credits earned in this dissertation research course count towards (fulfil) 24 credit hours of dissertation research requirements of the Ph.D. I&SE program. (F,W,S)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 980  Ph.D. diss research precand  1 to 9 Credit Hours
Full Title: Ph.D. dissertation research pre-candidate Dissertation research by a pre-candidate student of the Ph.D. in Industrial and Systems Engineering (I&SE) Program conducted under guidance of the faculty advisor. The credits earned in this dissertation research course count towards (fulfil) 24 credit hours of dissertation research requirements of the Ph.D. I&SE program. (F,W,S)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Industrial & Systems Engin

IMSE 990  PHD Dis Research Cand  1 to 9 Credit Hours
Full Title: Ph.D. dissertation research candidate Dissertation research by a candidate student of the Ph.D. in Industrial and Systems Engineering Program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Major is Industrial & Systems Engin

*  An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering:
(F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Information Systems and Technology

The program may be completed entirely on campus, entirely online, or through a combination of on-campus and online courses.

Admission

Bachelor's degree in engineering, a physical science, computer science, applied mathematics, business administration, or liberal arts with a minimum cumulative GPA of 3.0 or higher

Prerequisite Courses
• A course in Data Structures (IMSE 350/351, CIS 350/352, or equivalent)
• A course in computer programming, such as C++ or Java (IMSE 255, IMSE/CIS 150, CIS 205 or equivalent)

These course requirements may be completed after admission into the program.

The MS in IS&T program is a response to the need of students who want to complement, extend, and integrate technical and organizational knowledge on information systems. The program designed meet the need of the industry to incorporate enterprise wide information systems to be competitive in the global market place. Students who possess either technical knowledge about computers and information systems, or knowledge about information needs and information system requirements in organizations, but who want to expand their knowledge in a constructive way, constitute an important part of the intended audience.

The degree aims to achieve simultaneously the following educational goals.
1. Provide access to advances in the information systems field.
2. Provide necessary skills to effectively integrate information technology in organizations.
3. Provide training in specialized areas of information systems and technology.

Degree Requirements
The degree MS in IS&T requires a minimum of 30 credit hours.

Minimum Grade Requirement in addition to maintaining a minimum cumulative GPA of 3.0 or higher every semester:
1. Courses in which grades of C- or below are earned cannot be used to fulfill degree requirements.
2. No more than two courses in which grades of B- or below are earned can be used to fulfill degree requirements.

A minimum of a 3.0 cumulative GPA or higher is required at the time of graduation.

Advanced Standing
Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution as.

Students may transfer up to one-half (1/2) the minimum number of credit hours required for their master's or professional degree from another University of Michigan program.

Graduate Academic Policies can be found below:
http://catalog.umd.umich.edu/academic-policies-graduate/

Program Requirements
The program of study must satisfy the following distribution and course requirements:

Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CIS 556</td>
<td>Database Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

| IMSE 570 | Enterprise Information Systems | 3            |
| IMSE 5725 | Object Oriented System Design  | 3            |
| or CIS 572 | Object Oriented Systems Design | 3            |

Total Credit Hours 9

Concentration (15 credit hours)
Six concentration areas exist in the program. Five of the concentration areas are identified below while the sixth is an individual concentration that student develops jointly with the Program Advisor. Each concentration area includes one concentration core course (3 hrs), one cognate course (3 hrs) selected from one of the four remaining concentration areas in the program, and three concentration electives (9 hrs)

Area 1: Information Management Applications

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 5715</td>
<td>Modeling of Int Info Syst</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
<td>3</td>
</tr>
<tr>
<td>HRM 561</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 564</td>
<td>Meth &amp; Tech in ERP Sys Develop</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5755</td>
<td>Bus Proc Int using Entrpr Tech</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 586</td>
<td>Big Data Anal &amp; Visualitztn</td>
<td>3</td>
</tr>
<tr>
<td>MKT 515</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Area 2: Supply Chain and Information Systems Design

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 538</td>
<td>Intelligent Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 559</td>
<td>System Simulation</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5715</td>
<td>Modeling of Int Info Syst</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 580</td>
<td>Prod &amp; Oper Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 581</td>
<td>Prod &amp; Oper Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 544</td>
<td>Computer and Network Security</td>
<td>3</td>
</tr>
</tbody>
</table>

Area 3: Information Security and Quality

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 544</td>
<td>Computer and Network Security</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 5715</td>
<td>Modeling of Int Info Syst</td>
<td>3</td>
</tr>
<tr>
<td>CIS 527</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CIS 546</td>
<td>Security&amp;Privacy Wireless Ntwk</td>
<td>3</td>
</tr>
<tr>
<td>CIS 548</td>
<td>Sec and Priv in Cloud Comp</td>
<td>3</td>
</tr>
<tr>
<td>CIS 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIS 565</td>
<td>Software Quality Assurance</td>
<td>3</td>
</tr>
</tbody>
</table>
About the Program

Rapid changes in technology and increasing technological sophistication needed to maintain global competitiveness are causing information technology industries to encourage their workforce to advance their knowledge, skills, and expertise through graduate-level education and training. For many engineers, this means education beyond the master's degree. More specifically, the kind of advanced knowledge needed in niche or specialized areas of emerging technologies can only be offered through doctoral programs that not only allow engineers to acquire and strengthen their own knowledge but also educate them to become technical leaders and technology developers in their own companies. The Ph.D. in Information Systems Engineering is designed to meet the need of engineers who want to be the technology leaders of the future. It is a 50 credit hour postgraduate program and can be pursued either on a full-time or a part-time basis. The classes are held in the evenings for the convenience of working engineers. The areas of specialization available in the program include information management and knowledge engineering, computer networks and computer architecture, intelligent systems and human/computer interaction, graphics and visualization, supply chain informatics, web services and security.

Admission Requirements

The following are the requirements for admission in the Ph.D. program.

1. A bachelor's degree in engineering or computer science from an accredited program with an expected GPA of 3 or higher on a 4-point scale.
2. A master's degree in engineering or computer science from an accredited program with an expected GPA of 3.5 or higher on a 4-point scale or 6.5 or higher on a 9-point scale
3. GRE taken within 5 years prior to admission
4. TOEFL for international students (minimum score of 84 in internet-based test)
5. At least one advanced mathematics course at the master's level (If the student has not taken an advanced math course at the master's level, an appropriate math course will be recommended as a prerequisite. This course must be successfully completed within the first year of the program.)
6. Three recommendation letters from faculty and/or employer (The recommendation letters must be on official letterhead and indicate the student's research potential.) Each recommender must also complete the Recommendation for Admission form.
7. A Statement of Purpose describing academic and research background, career goals and educational objectives and research interest

Graduation Requirements

A student must complete a minimum of 50 credit hours (beyond master's) for graduation. Out of the 50 credit hours, 24 credit hours will be based on coursework (beyond master's) and 26 credit hours will be based on Ph.D. dissertation.

The student must maintain a GPA of 3.2 out of 4.0 for good academic standing and graduation. Only one B- and no C grade will be allowed in the program.

Qualifying Examination

- The qualifying examination must be taken within 24 months after admission in the program. This will typically occur after finishing the core course, at least two specialization courses, and two courses outside the specialization area.
- The student must be in good academic standing at the time of the qualifying examination.

Information Systems Engineering

About the Program

Rapid changes in technology and increasing technological sophistication needed to maintain global competitiveness are causing information technology industries to encourage their workforce to advance its knowledge, skills, and expertise through graduate-level education and training. For many engineers, this means education beyond the master's degree. More specifically, the kind of advanced knowledge needed in

Area 4: Web Information Management

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 568</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>or ECE 537</td>
<td>Data Mining</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Core

CIS 562  Web Information Management  3

Concentration Electives

CIS 525  Web Technology  3
CIS 527  Computer Networks  3
CIS 534  Semantic Web  3
CIS 559  Prin of Social Netwk Science  3
CIS 568  Data Mining  or ECE 537  Data Mining  3
IMSE 577  Human-Computer Interaction  or CIS 577  S/W User Interface Dsgn&Analys  3
CIS 550  Obj-Oriet Prog and Its Applic  3
CIS 571  Web Services  3
CIS 586  Advanced Data Management  3

Area 5: Information Systems Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 586</td>
<td>Advanced Data Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Core

CIS 586  Advanced Data Management  3

Concentration Electives

CIS 527  Computer Networks  3
CIS 568  Data Mining  or ECE 537  Data Mining  3
CIS 544  Computer and Network Security  3
CIS 553  Software Engineering  3
IMSE 5715  Modeling of Int Info Syst  3
IMSE 577  Human-Computer Interaction  or CIS 577  S/W User Interface Dsgn&Analys  3
CIS 578  Advanced Operating Systems  3
CIS 562  Web Information Management  3
CIS 550  Obj-Oriet Prog and Its Applic  3
CIS 575  Software Engineering Mgmt  3

Electives (6 credit hours)

Other CIS, ECE, IMSE and business graduate courses may be taken per advisor approval.

A thesis may be substituted for six hours of electives, on approval by the program director.
- The student must select three areas for the qualifying examination and declare one of the areas as the specialization area typically the area of the student’s research.
- There will be two examiners in the specialization area (in the area of student’s research). The other two areas will be minor areas (of the student’s choice, but approved by the Doctoral Program Council) and will have one examiner each.
- The examination in the specialization area will include both written and oral tests. Examination in the minor areas will be written only.
- The student will select the examination areas, which must then be approved by the Doctoral Program Council. The Doctoral Program Council will assign the examiners for each of the areas selected.
- The Doctoral Program Council will review and approve the examination results.
- A student failing the qualifying examination the first time will be allowed to take it again; however, if the student fails it the second time, he/she will be terminated from the program.

**Preliminary Examination**

- The Doctoral Program Council must approve the dissertation topic, the proposal outline, and the dissertation committee prior to the preliminary examination.
- The student will make an open oral presentation, which has been prepared in consultation with the dissertation advisor, in defense of the proposal.

**Candidacy**

A student will become a candidate for the Ph.D. degree after completing the required coursework with a minimum GPA 3.2 out of 4.0 and after passing both the qualifying and the preliminary examinations. At this point, the student will be allowed to register for the dissertation work.

**Dissertation Committee**

The dissertation committee will include a minimum of four faculty members. One of these members must be from outside the College of Engineering and Computer Science. One of the faculty members will be the dissertation advisor and will serve as the chair of the dissertation committee. Depending on the dissertation topic, other members, including a qualified industry member, may be included in the dissertation committee. The industry member’s curriculum vitae must be submitted to the Doctoral Program Council for approval.

**Dissertation and Dissertation Defense**

The dissertation must include original research work of archival quality. The student must submit a written copy of the dissertation to the dissertation committee for approval. The work must be defended at a final oral examination open to other faculty, students, and the interested public.

**Other Requirements**

While there are no formal residency requirements for the part time students, it is expected that each Ph.D. student will spend sufficient time on campus for conducting research, interacting with other graduate students, and fostering intellectual activities. All students in the Ph.D. program are required to attend graduate seminars in the College of Engineering and Computer Science. After attaining candidacy, each Ph.D. student is required to present at least one seminar per year on his/her research until the dissertation is completed. All Ph.D. students are required to attend these research seminars. After attaining candidacy, each Ph.D. student is expected to spend at least 12 hours per week on campus working on his/her research and discussing research issues with faculty and fellow students.

**Course Curriculum**

The course curriculum will consist of one required core course, four specialization courses, three elective courses, and a seminar course. Each student must submit a course plan with specified specialization area within one semester after starting the program.

**Core Course (3 credit hours)**

The student must complete the core course titled “Information Engineering.”

**Specialization Courses (12 credit hours)**

Four courses must be selected in an area of concentration with prior approval from the director of the doctoral program. At least two of these concentration courses must be 600-level courses.

**Elective Courses (9 credit hours)**

The student must take three elective courses, at least two of which must be from outside the student’s concentration area.

**Seminar Course (0 credit hours)**

The student must register for and participate in the seminar course each semester after attaining candidacy and until the completion of the dissertation. The seminar course will be of pass/fail type and will not carry any credits.

**Dissertation (26 credit hours)**

The dissertation will be of pass/fail type and will not carry any letter grades.

**Ph.D.-Level Courses**

All Ph.D. courses must be 500 level and above. However, not all 500-level courses may be accepted in the Ph.D. program.

**Transfer Credit**

Up to 9 credit hours for courses from another university will be accepted as transfer credits; however, the Doctoral Program Council must approve the acceptance of transfer credits.

**Additional Information**

Additional information on Ph.D. programs can be requested from:

The Office of Interdisciplinary Programs,
College of Engineering and Computer Science,
University of Michigan-Dearborn, 116 MSEL,
4901 Evergreen Road,
Dearborn, MI 48128-2406

**Intelligent Systems in Engineering Applications**

This certificate program introduces students to the core concepts of intelligent systems and a broad range of techniques for building, testing and evaluating intelligent systems. Topics include: intelligent system
design, training and evaluation, decision trees, rule based systems, Bayesian learning, Support Vector Machines, neural network systems, and fuzzy systems. A variety of application cases will be studied in the courses under this program. (12 credits hours)

Certificate offered on Campus and via Distance Learning

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 579</td>
<td>Intelligent Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Coursework

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Complete 3 courses from the following (9 credits):</td>
<td></td>
</tr>
<tr>
<td>ECE 537</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 576</td>
<td>Information Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5831</td>
<td>Pat Rec &amp; Neural Netwks</td>
<td>3</td>
</tr>
</tbody>
</table>

Manufacturing Systems Engineering

Admission

Admission to the program as a regular student requires a BS degree in Engineering. Students with a degree in computer science or engineering can be admitted provisionally and must take certain undergraduate courses to pave the way for graduate work. Undergraduate degrees must be from an accredited program, and for regular admission must be with an average of B or better. Each applicant should present one complete, official transcripts of all prior college work. In special cases, it may be necessary for applicants to schedule an interview with the program director to review completeness of undergraduate preparation and other qualifications.

In addition to the above admissions requirements, the following are also required.

1. The entering student must have an undergraduate-level background in probability and statistics. Otherwise, the student will be required to take an undergraduate-level statistics course (equivalent to IMSE 317) within the two semesters after his admission. No credit will be given for this course.

2. The entering student must have a background in engineering materials. Otherwise, the student will be required to take either ENGR 250 (or equivalent) as a prerequisite to AENG 587 or ECE 385 (or equivalent) as a prerequisite to ECE 539. No credit will be given for the undergraduate courses.

Degree Requirements

The MSE in Manufacturing Systems Engineering requires a minimum of 30 credit hours.

The accumulated grade point average in the program must be at least a B to receive the degree. No more than one B- will be allowed under any circumstances.

Advanced Standing

Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution. Students may transfer up to one-half (1/2) the minimum number of credit hours required for their master's or professional degree from U-M/non-Rackham departments and programs (including Ann Arbor, Dearborn and Flint).

Course Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core Courses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The following courses are required:</td>
<td></td>
</tr>
<tr>
<td>AENG 587</td>
<td>Automotive Manuf Processes</td>
<td>3</td>
</tr>
<tr>
<td>or ECE 539</td>
<td>Production of Elec Prods</td>
<td></td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt and Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 580</td>
<td>Prod &amp; Oper Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 580</td>
<td>Mgt of Prod and Proc Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select any five courses from the list below:</td>
<td>15</td>
</tr>
<tr>
<td>AENG 584</td>
<td>Lightweight Automotive Alloys</td>
<td></td>
</tr>
<tr>
<td>AENG 586</td>
<td>Design &amp; Mfg: Ltwt Auto Mat</td>
<td></td>
</tr>
<tr>
<td>AENG 588</td>
<td>Design &amp; Manufac for Environment</td>
<td></td>
</tr>
<tr>
<td>AENG 589</td>
<td>Auto Assembly Systems</td>
<td></td>
</tr>
<tr>
<td>AENG 590</td>
<td>Selected Topics</td>
<td></td>
</tr>
<tr>
<td>ECE 516</td>
<td>Electronic Materials &amp; IC Proc</td>
<td></td>
</tr>
<tr>
<td>EMGT 541</td>
<td>Acct Fund for Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 502</td>
<td>Computer-Integrated Mfg</td>
<td></td>
</tr>
<tr>
<td>IMSE 511</td>
<td>Design and Analysis of Exp</td>
<td></td>
</tr>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td></td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td></td>
</tr>
<tr>
<td>IMSE 517</td>
<td>Managing Global Programs</td>
<td></td>
</tr>
<tr>
<td>IMSE 538</td>
<td>Intelligent Manufacturing</td>
<td></td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td></td>
</tr>
<tr>
<td>IMSE 581</td>
<td>Prod &amp; Oper Engineering II</td>
<td></td>
</tr>
<tr>
<td>ME 580</td>
<td>Advanced Engineering Materials</td>
<td></td>
</tr>
<tr>
<td>ME 582</td>
<td>Injection Molding</td>
<td></td>
</tr>
<tr>
<td>ME 585</td>
<td>Cast Metals in Eng Design</td>
<td></td>
</tr>
<tr>
<td>ME 586</td>
<td>Materials Consid in Manufactur</td>
<td></td>
</tr>
<tr>
<td>ME 587</td>
<td>Automotive Composites</td>
<td></td>
</tr>
<tr>
<td>HRM 561</td>
<td>Human Resource Management</td>
<td></td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td></td>
</tr>
<tr>
<td>DS 520</td>
<td>Applied Statistical Modeling</td>
<td></td>
</tr>
<tr>
<td>OB 610</td>
<td>Intrnal Statistical Modeling</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 33

A thesis may be submitted in lieu for six hours of electives, on approval by the program director. The thesis work may be a company project if it meets certain requirements.
IMSE 500  Models of Oper Research  3 Credit Hours
The method of mathematical modeling and its application to decision-making problems in organizations. Some widely used models and techniques: linear programming, queuing, inventory, and simulation.
Restriction(s):
Can enroll if Class is Graduate

IMSE 501  Human Factors & Ergonomics  3 Credit Hours
The analysis and prediction of human performance in industrial and other man-machine systems using work sampling, time-motion analysis, synthetic and standard time study, and learning curves, in the design of such systems. Lecture and laboratory. Cannot receive credit for both IMSE 442, and IMSE 501. This class may be scheduled at the same time as the undergraduate course IMSE 442. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 317* or IMSE 510*
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 5010  Fundamentals of Program Mgt  3 Credit Hours
An overview of the project/program management framework and knowledge areas including plan development and execution; management of scope, time, cost, quality, human resource, communications, risk, and procurement. Typical program phases and life cycles observed in defense, construction, automobile, and software industries. Program organizational structures, program management processes, international project management, role of software tools for program management, product development, applications of Lean Product Development techniques, cutting waste and lead time in program management.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Business

IMSE 502  Computer-Integrated Mfg  3 Credit Hours
This course provides basic knowledge of elements in Computer-Integrated Manufacturing Systems, with particular emphasis on Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Computer-Aided Process Planning (CAPP), materials handling, and information flow in manufacturing systems. Hands-on experiments and course projects are required. Two lecture hours and three laboratory hours. Credit cannot be given for both IMSE 483 and IMSE 502. This class may be scheduled at the same time as the undergraduate course IMSE 483. Graduate students will be required to do additional research paper and/or project.
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 503  Computer-Aided M/C & Tool Desg  3 Credit Hours
Study of the fundamentals of machine tool design, cutting tools, metal forming dies, and jig fixtures for practical applications in machining and assembly. Principles of design for manufacture and assembly as applied to tool and machine design. Laboratory exercise and projects are required using computer-aided design software. Two lecture hours and three laboratory hours. Credit cannot be given for both IMSE 484 and IMSE 503. This class may be scheduled at the same time as the undergraduate course IMSE 484. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 382 or ME 381
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 504  Metal Forming Processes  3 Credit Hours
This course focuses on fundamentals of metal forming processes; mechanics of metal forming; formability of manufacture; and economic aspect of the process. Emphasis is placed on analysis of bulk and sheet metal forming processes as applied to practical cases such as automobile manufacturing. Laboratory and course project are required. Credit cannot be given for both IMSE 488 and IMSE 504. This class may be scheduled at the same time as the undergraduate course IMSE 488. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 382 or IMSE 381
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 505  Optimization  3 Credit Hours
Prerequisite(s): IMSE 300 or IMSE 500

IMSE 508  Modeling of Large-Scale Sys  3 Credit Hours
The modern and classical concepts and tools required for modeling, analysis and synthesis of large-scale dynamic systems. Topics include system dynamics, interpretable structural modeling, cross-impact analysis, information theory, theory of hierarchical systems. Emphasis is on constructing models of real-world problems taken from urban, industrial, transportation, and health care systems. Students are asked to select problems of interest and present final project reports.
Prerequisite(s): IMSE 505 and IMSE 506

IMSE 510  Probability & Statistical Mod  3 Credit Hours
Prerequisite(s): IMSE 317

IMSE 511  Design and Analysis of Exp  3 Credit Hours
One factor, two factor, and multifactor experiments. Fixed random and mixed models. Blocked confounding, incomplete blocks, factorial experiments, fractional factorial experiments. Introduction to response surface analysis.
Prerequisite(s): IMSE 510

IMSE 512  Taguchi Method of Quality Eng  3 Credit Hours
Quality engineering methodology developed by Genichi Taguchi. Design and analysis of experiments using orthogonal arrays and linear graphs. Accumulation analysis for categorized data. Signal-to-noise ratio as a measure of quality characteristics. Simulation using orthogonal arrays. Parameter design for reducing variability around the target without cost increase. Tolerance design for reducing variability with minimum cost increase. Evaluation and improvement of measurement.
Prerequisite(s): IMSE 510

IMSE 513  Robust Design  3 Credit Hours
Students will learn models and methods in the context of overall strategies to empirically study the design of products and manufacturing processes to reduce variability and to reduce sensitivity to parameter variation. Topics include: process capability studies and measures, basic DOE concepts, factorial experiments, evaluating sources of variation, evolutionary operation and adaptive statistical process control.
Prerequisite(s): IMSE 510
IMSE 514  Multivariate Statistics  3 Credit Hours
Linear statistical models used in simple and multiple regression, and analysis of variation. Principles and techniques of principle component analysis are studied and applied to business and engineering problems using statistical computer software. (YR)
Prerequisite(s): IMSE 510

IMSE 515  Fundamentals of Program Mgt  3 Credit Hours
An overview of the project/program management framework and knowledge areas including plan development and execution, scope management, time management, cost management, quality management, human resource management, communications management, risk management, and procurement management. Typical Program Phases and Life Cycles observed in Defense, Construction, Automobile, and Software Industries. Program Organizational Structures, Program Management Processes, and International Project Management are covered. Role of software tools for Program Management and Product Development are discussed. Applications of Lean Product Development Techniques are considered. Cutting waste and lead time in program management are covered. Case studies are used extensively throughout the course.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

IMSE 516  Project Management and Control  3 Credit Hours
Project Planning, Scheduling, and Controlling functions are discussed in detail including work breakdown structure, CPM and PERT methods, resource allocation and leveling techniques, cost control and minimization, trade-off analysis, learning curves overlapping relationships and concurrent engineering, multiple project execution and optimization. Applications of Lean Techniques in program management are discussed as well as the role of IT in accelerating the product development and reducing the program time. The importance of integrating the Supply Chain in the Product Development is also considered. Case studies and project management software are used throughout the course.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

IMSE 517  Managing Global Programs  3 Credit Hours
This course focuses on some of the central strategic and organizational problems that arise in managing global programs, including cultural conflicts, developing and managing international managers, global and local brands, and organizing to resolve global-local conflicts. The course uses a combination of case studies, problems, lectures and discussion, over a wide variety of companies and countries.
Prerequisite(s): IMSE 515
Restriction(s):
Can enroll if Level is Rackham or Graduate or Professional Development

IMSE 519  Quan Meth in Quality Engin  3 Credit Hours
This course introduces the advanced quantitative and analytical methods used in quality measurement, prediction, control and improvement. The topics include sampling design and plan, control charts, statistical quality control, time series, process capability analysis and quality cost analysis. Quality related topics in robust and tolerance design are also included.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 520  Managerial Decision Analysis  3 Credit Hours
Normative decision analysis, decisions, structures, and trees. Utility theory, game theory, and statistical decision theory are introduced. Applications of the theories to management studies in capital investment, bidding, purchasing, and risk analysis are discussed.
Prerequisite(s): IMSE 510

IMSE 5205  Eng Risk-Benefit Analysis  3 Credit Hours
Analysis risk assessment, decision and cost-benefit analysis, and fault-tree methods for describing and making decisions about societal risks associated with large engineering projects. Balancing risks and benefits in situations involving human safety, environmental risks, and financial uncertainties. Presentations of major risk assessment and the public decision process are associated with them.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if College is Business

IMSE 521  Mfg Cost Estimation & Control  3 Credit Hours
In this course, concepts of strategic costing in product development and manufacturing are introduced. Engineering economy techniques are used in the study of life cycle cost elements. Equipment acquisition and replacement justification methods under risk and uncertainty are presented.
Restriction(s):
Can enroll if Class is Graduate

IMSE 5215  Program Budget, Cost Est & Con  3 Credit Hours
This course focuses on cost estimation and control for program managers and engineers. The course introduces a systematic approach for applying engineering economy techniques in cost estimating, resource planning, cost planning, cost management and control, and the study of life cycle cost elements. An introduction to decisions under risk and uncertainty as well as an introduction to project crashing are also presented.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate
Can enroll if Level is Rackham or Professional Development or or Doctorate
Can enroll if College is Engineering and Computer Science or Business

IMSE 525  Fin & Econ Software Appl  1 Credit Hour
This course applies concepts and techniques of financial management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 510
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 526  Marketing Software Application  1 Credit Hour
This course applies concepts and techniques of marketing management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 535
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

EMGT 535
IMSE 557  Managerial Acct Software Appl   1 Credit Hour
This course applies concepts and techniques of managerial accounting to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 540
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5285  Human Resource Software Appl   1 Credit Hour
This course applies concepts and techniques of human resource management to business and engineering systems case studies. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Corequisite(s): EMGT 545
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 532  Information for Manufacturing   3 Credit Hours
Acquiring and organizing design and manufacturing information (including geometric modeling, group technology, and automated data acquisition). Identifying kinds needed, sources, and recipients. Ensuring information quality; establishing criteria for selecting processing modes and media. Designing, installing, commissioning, and operating information-handling systems. Handling information in production systems.
Prerequisite(s): (ECE 539 or ME 588) and IMSE 530
Restriction(s):
Can enroll if Class is Graduate

IMSE 533  Manufacturing Systems   3 Credit Hours
This course introduces methodologies and tools for modeling, design and operations planning of manufacturing systems. Topics include introduction to integrated manufacturing systems, manufacturing system and data modeling methodologies, process planning, group technology, manufacturing system layout, scheduling, push and pull production systems. Industrial case studies are presented and discussed.
Restriction(s):
Can enroll if Class is Graduate

IMSE 534  Human Performance Engin in Mfg   3 Credit Hours
The human as a systems component in an information processing context emphasizing capabilities and limitations. The roles of sensing, perception, decision making, short term memory, long term memory, motivation, expectations and attention. An overview of Learning Organization concepts emphasizing personal mastery, mental models, and team learning. A strategy for design of the user-system interface. Analysis methods including functional analysis, traditional and object-oriented task analysis, and cognitive walk-through. Team design project and individual exercises. Emphasis on experiential learning.
Prerequisite(s): IMSE 530
Restriction(s):
Can enroll if Class is Graduate
Can enroll if College is Engineering and Computer Science

IMSE 536  Machinery Diagnostics   3 Credit Hours
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate

IMSE 537  Metal Machining Processes   3 Credit Hours
Detailed study of the principles of conventional and non-traditional metal removing processes, machine tools accuracy, cutting fluids, and cutting tools. The course emphasis will be on the mechanics of metal cutting, machining processes, cutting tool materials and tool geometry, selection of cutting conditions, planning for machining and optimization of manufacturing process. Role of numerical control in improving machining process and productivity of manufacturing system.
Prerequisite(s): ME 381 or IMSE 382 or AENG 587

IMSE 538  Intelligent Manufacturing   3 Credit Hours
A comprehensive and integrated approach to topics associated with the science of artificial intelligence and their role in today's manufacturing environments. Design and management issues including information systems in an automated and integrated manufacturing environment.
Prerequisite(s): IMSE 317
Restriction(s):
Can enroll if Class is Graduate

IMSE 543  Industrial Ergonomics   3 Credit Hours
Effective ergonomic interventions in industrial environment enhance productivity, safety and job satisfaction. This course introduces engineers and engineering students how to apply ergonomic principles in designing industrial and manufacturing operations in which people play a significant role, so that human capabilities are maximized, physical fatigue is minimized, and performance is optimized. Case studies and topics emphasize industrial applications.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 544  Industrial Biomechanics   3 Credit Hours
This course introduces the mechanical behavior of the musculoskeletal systems as related to physical work activities. Fundamentals of human body mechanics (Kinetic and Kinematic aspects of locomotion, body link systems, muscle strength and performance), muscle fatigue and musculoskeletal injury mechanism are covered with application to design of physical work activities and equipment. (YR).
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 545  Vehicle Ergonomics I   3 Credit Hours
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate
IMSE 546  Safety Engineering  3 Credit Hours
Safety requirements for production processes, equipment, and plants; organization and administration of safety programs, current safety laws, current occupational safety research.
Prerequisite(s): IMSE 442

IMSE 549  Product Design and Evaluation  3 Credit Hours
Design approaches and processes used in developing customer/user-oriented products. Study of widely used product evaluation techniques: methods of observation, communication and experimentation; subjective (e.g., psychological scaling) and objective measurement methods. Review of product design and evaluation case studies. Laboratory projects to evaluate several products.
Prerequisite(s): IMSE 442

IMSE 550  Data Management  3 Credit Hours
Topics in computer organization; principle data structures (stacks, trees, linked lists) and their use; searching and sorting; algorithm specification, and recursion. Programming assignments will deal with applications of these subjects.

IMSE 551  Compiler Construction  3 Credit Hours
The design and construction of compilers and programming systems. Lexical scan; parsing techniques; code generation and optimization; storage allocation. Applications of formal language theory in compiler design. Translator writing systems; XPL.
Prerequisite(s): IMSE 550

IMSE 552  Design/Analysis of Algorithms  3 Credit Hours
Design, evaluation, and communication of algorithms for solving problems using a digital computer. Topics include problem-solving approaches, algorithm notation, determination of algorithm correctness, measures of efficiency, improvement of algorithms. Examples and homework in designing algorithms for data processing, scheduling, combinatorial optimization, and elementary computer graphics, and numerical analysis.
Prerequisite(s): IMSE 550

IMSE 553  Software Engineering  3 Credit Hours
Program design methodologies; control flow and data flow in programs; program measurement. Software life cycle; large program design, development, testing, and maintenance. Software reliability and fault-tolerance. Evolution dynamics of software.
Prerequisite(s): IMSE 550

IMSE 554  Management Info Systems  3 Credit Hours
Basic systems concepts, role of a system analyst in an information system, systems investigation, feasibility study, output/input design, hardware/software evaluation and selection, data management, security considerations, systems implementation, information systems documentation, systems projects estimation and control. Students will be asked to develop a complete information system from case studies.
Prerequisite(s): IMSE 454

IMSE 555  Decision Support/Expert Sys  3 Credit Hours
Decision support process and decision support systems, development tools, executive support systems, expert systems and their development processes, expert shells, integration of decision support and expert systems.
Prerequisite(s): IMSE 350

IMSE 556  Database Systems  3 Credit Hours
Data structures and file processing; GUIDE and CODASYL reports; comparisons among the database management systems, relational, hierarchical, and network approaches; system design guidelines; DDL and Schema/Subschema; DML and Query language.

IMSE 557  Comp Networks and Comm  3 Credit Hours
To study the nature of computing communication and distributing processing techniques, compare networking options, introduce specific business applications that require data communication and networks, and examine the role of communication software in the system, and discuss the related management issues.
Prerequisite(s): IMSE 454

IMSE 558  Electronic Commerce  3 Credit Hours
This course examines how new information technologies and networks affect the exchange of goods and services between buyers and sellers in firms. What are economics of different electronic commerce models for firms? The course combines critical evaluation of business strategies with hands-on experience in building supporting electronic commerce systems utilizing electronic data interchange (EDI) software. (YR).
Prerequisite(s): IMSE 570 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 559  System Simulation  3 Credit Hours
The modeling and simulation of discrete-change, continuous-change and combined-change stochastic systems. Conducting simulation studies using contemporary software such as SLAM II or random number generation, distribution sampling, and output analysis. Comparisons with analytical queuing models.
Prerequisite(s): IMSE 510

IMSE 561  Total Qual Mgmt and Six Sigma  3 Credit Hours
This course covers implementing Total Quality Management (TQM), undertaking Six Sigma Projects, and applying Baldrige National Quality Award criteria and ISO 9000 principles to improve quality performances in an organization. Topics include Definitions and Importance of Quality, Quality Costs, Quality Function Deployment (QFD), Product Specification and Critical-to-quality Measures (CQM), Statistical Quality Control (SQC), Robustness Concepts, Quality System Design and Evaluation. Six Sigma and DMAIC Methodologies, Design for Six Sigma (DFSS) process, IDOV (Identity requirements, Design alternatives, Optimize the design and Verify process capability) Methodology, and several other concepts and tools related to quality are also covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Class is Graduate
IMSE 564  Meth & Tech in ERP Sys Develop  3 Credit Hours
Students will explore different technology tools and methodologies for building/customizing applications in ERP systems to meet business need of an Enterprise. Extensive software design and development activities will be covered using modular/Object Oriented Programming, Data Modeling, Data Dictionary, Database Access, User Interface, Dialogue Programming, Interactive Report Design using appropriate tools such as, ABAP Workbench, SAP HANA Native Application Development, and SAP Project Implementation phases.
Prerequisite(s): IMSE 570 and (IMSE 556 or CIS 556)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5655  Supply Chain Management  3 Credit Hours
This course will address theories, concepts, models, methodologies and techniques for managing a supply chain. Topics include supply chain strategy, drivers and metrics of performance, designing global and regional supply chain networks using optimization models, planning demand and supply in a supply chain using forecasting, aggregate planning, and inventory optimization models, designing the transportation systems, pricing, and employing IT systems effectively in supply chains.
Prerequisite(s): IMSE 500 and IMSE 510
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 567  Reliability Analysis  3 Credit Hours
Statistics of reliability and life testing. Application of stochastic models for failure based on Poisson and related processes. Use of exponential and extreme value distribution in reliability. Use of Markov process in the areas of equipment reliability, maintenance and availability.
Prerequisite(s): IMSE 510

IMSE 569  Sys Simulation in Auto Engin  3 Credit Hours
The modeling and simulation of discrete, continuous and combined change stochastic systems. Conducting simulation studies using contemporary software such as ARENA and WITNESS. Topics in simulation methodology include random number generation, distribution sampling, input and output analysis. Integration techniques for continuous simulation, application to design of manufacturing and automotive systems.
Prerequisite(s): IMSE 510

IMSE 570  Enterprise Information Systems  3 Credit Hours
The purpose of this course is to provide a foundation for the analysis, design and implementation of enterprise information systems. Topics include systems and organization theories, and information systems planning and evaluation. Students will be also introduced to various systems development life cycle phases of an enterprise information system. Students will acquire an understanding of the flow of information (forecasts, financial, accounting and operational data) within an enterprise and the factors that should be considered in designing an integrated enterprise information system. This includes all systems in the business cycle from revenue forecasts, production planning, inventory management, logistics, manufacturing, accounts payable, sales, accounts receivable, payroll, general ledger and report generation. Specifications for some of these systems will be developed utilizing ERP software such as SAP R/3 application development software suite.
(YR).———*
Restriction(s):
Can enroll if Level is Rackham or Graduate

IMSE 5715  Modeling of Int Info Syst  3 Credit Hours
A review of approaches for modeling of integrated information systems. ARIS architecture. Data, control, function, and organization views of an information system. Requirements definition, design specification, and implementation definition of the different views. Process chain diagrams. Management of ERP projects. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5725  Object Oriented System Design  3 Credit Hours
Students will be introduced to fundamental concepts and methods of object oriented design and development. Topics that will be covered include object oriented database concepts, data models, schema design (conceptual schemas and physical schemas), query languages, physical storage of objects and indexes on objects, version management, schema evolution and systems issues such as concurrent control and recovery from failure. For application programming, a programming language such as C++ will be used for database design and query language. (YR).
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 574  IS Based Prod Planning & Cont  3 Credit Hours
Students will be introduced to theories, models, methods and techniques in demand forecasting, inventory management, capacity planning, production scheduling and management components, in production planning and control for an enterprise. Application systems to model information sharing between these components will be developed using ERP software such as the SAP R/3 application development software suite. (YR).
Prerequisite(s): IMSE 510 and IMSE 570 and IMSE 571
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 5755  Bus Proc Int using Entrpr Tech  3 Credit Hours
Full Title: Business Process Integration using Enterprise Technology
This course introduces the concept of integration, optimization and configuration of strategic business processes across the enterprise using ERP software technology. Use cases and specifications for some of these systems are introduced in different functional areas, such as Finance, Human Capital Management, Logistics, and Project Systems utilizing ERP software. (F)
Restriction(s):
Can enroll if Level is Rackham or Graduate

IMSE 577  Human-Computer Interaction  3 Credit Hours
Full Course Title: Human-Computer Interaction for UI and UX Design
This course introduces current theory and design techniques concerning how user interfaces (UI) and user experience (UX) should be designed and assessed to be easy to learn and use. Course includes flowing general modules introduction of HCI & UX; Interface/Interaction design strategy; Advanced issues in HCI; and Evaluation methods.
Prerequisite(s): CIS 553
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
IMSE 579  Software Int Mfg & Logis Mgmt  3 Credit Hours
Students will be introduced to theories, models and techniques in manufacturing, logistics components and their interaction within an enterprise. Topics that will be covered include production/shop order analysis and management, capacity planning, and materials planning and inventory management. Application systems to model information sharing between these components will be developed using ERP software such as the SAP R/3 application development suite. (YR).
Prerequisite(s): IMSE 510 and IMSE 570 and (IMSE 571 or IMSE 5715)
Restriction(s):
Can enroll if Class is Post-baccalaureate Cert only or Post-baccalaureate NCFD or Graduate

IMSE 580  Prod & Oper Engineering I  3 Credit Hours
Production and operations management techniques including forecasting, inventory control, MRP, detailed scheduling, aggregate planning, process variability and its effects on throughput and inventory, factory physics principles, and lean methods.
Prerequisite(s): IMSE 510

IMSE 581  Prod & Oper Engineering II  3 Credit Hours
This course addresses the advanced theory and techniques of production and inventory systems. Topics include advanced forecasting methods, production scheduling and lot sizing, stochastic single-and multi-item inventory systems, and service operations. This course also includes discussions of research articles on production and inventory systems.
Prerequisite(s): IMSE 580 or EMGT 520

IMSE 5825  Industrial Controls  3 Credit Hours
This course introduces the principle aspects of computers and their applications in systems control, principles of automation, with emphasis on manufacturing industries. Discussion on the hardware and software associated with this task and other topics such as integrated systems modeling, sensor technologies, digital and analog signal processing and control, and information communication are also included. Laboratory exercises and projects are required. Credit cannot be given for both IMSE 482 and IMSE 5825. This class may be scheduled at the same time as the undergraduate course IMSE 482. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): ECE 305
Restriction(s):
Can enroll if Class is Post-baccalaureate NCFD or Graduate

IMSE 583  Concurrent Design &Manufacture  3 Credit Hours
This course will cover topics in manufacturing design and analysis with emphasis on the parallel design of product and processes. Topics include principles of design theory, concurrent engineering, group technology, cost estimating, assembly systems, and design for assembly and manufacture. Design projects using computer tools are required on a team-oriented basis.
Prerequisite(s): IMSE 382

IMSE 584  Logistical Systems  3 Credit Hours
Introduction to concepts of physical distribution and logistics management. Quantitative treatment of topics in materials management, transportation, forecasting, warehouse location. Logistical system design techniques which synthesize the above topics in order to design a fundamental system.
Prerequisite(s): IMSE 580

IMSE 585  Material Handling Systems  3 Credit Hours
Studies of material handling methods and equipment, study of techniques used in the analysis and design of material handling systems, study of storage and warehousing systems.
Prerequisite(s): IMSE 500

IMSE 586  Big Data Aanal & Visuliztn  3 Credit Hours
Topics covered include Big Data's role in engineering, Data Visualization and Infographics Design Principles, Univariate, Bivariate and Multivariate Data Visualization, Visualization Groups, Clustering Distance Measures, Hierarchical, Partition-Based and Fuzzy Clustering, Predictive Analytics using Principal Component Analysis, Multivariate Linear Regression, Discriminant Analysis, and Logistic Regression. Software Tools and Techniques for Visualization and Data Analytics such as Tableau, SAS VA, Pentaho and R. (F)
Prerequisite(s): IMSE 510
Corequisite(s): IMSE 510

IMSE 587  Facilities Planning  3 Credit Hours
Analysis, planning and design of physical facilities utilizing operations research, engineering, and economic principles. Synthesis of physical plant equipment and man into an integrated system for either service or manufacturing activities. Design of material handling systems. Students are required to select problems of interest and present design project reports. Credit may not be given for both IMSE 474 and IMSE 587. This class may be scheduled at the same time as the undergraduate course IMSE 474. Graduate students will be required to do additional research paper and/or project.
Prerequisite(s): IMSE 500

IMSE 588  Bldg High Perf Learning Org  3 Credit Hours
The purpose of this course is to develop students’ knowledge and skills to explore and experience how the disciplines of systems thinking, personal mastery, mental models, team learning and shared vision impact on organizational learning and influence management practices for building highly performing organizations.

IMSE 590  Grad Study in Sel Topics I  1 to 3 Credit Hours
Individual or group of selected topics in industrial and systems engineering.
Restriction(s):
Can enroll if Class is Graduate

IMSE 591  Grad Study in Sel Topics II  1 to 3 Credit Hours
Continuation of IMSE 590.
Restriction(s):
Can enroll if Class is Graduate

IMSE 592  Big Data Aanal & Visuliztn  3 Credit Hours
Vehicle package specifications related to exterior and interior design reference points, dimensions and curb loadings. Benchmarking package studies, ergonomic tools and design practices used in the automobile industry. Driver positioning considerations; seat height, heel points, hip points, steering wheel location, seat pan, and back angles. Pedal design issues, gear shift positioning. Visibility of instrument panel space. Armrest and console design considerations. Principles and considerations in selecting and location types and characteristics of controls and displays on instrument panels, doors, consoles, and headers. Engine compartment packaging issues. Perception of interior spaciousness and visibility of the road over cowl and hood.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate

IMSE 593  Vehicle Package Engineering  3 Credit Hours
Vehicle package specifications related to exterior and interior design reference points, dimensions and curb loadings. Benchmarking package studies, ergonomic tools and design practices used in the automobile industry. Driver positioning considerations; seat height, heel points, hip points, steering wheel location, seat pan, and back angles. Pedal design issues, gear shift positioning. Visibility of instrument panel space. Armrest and console design considerations. Principles and considerations in selecting and location types and characteristics of controls and displays on instrument panels, doors, consoles, and headers. Engine compartment packaging issues. Perception of interior spaciousness and visibility of the road over cowl and hood.
Prerequisite(s): IMSE 442
Restriction(s):
Can enroll if Class is Graduate

IMSE 600  Research in IMSE  1 to 3 Credit Hours
Individual or group study or research in a field of interest to the student. Topics may be chosen from any of the areas of industrial and systems engineering. The student will submit a project report and give an oral presentation at the close of the term.
Restriction(s):
Can enroll if Class is Graduate
IMSE 605  Advanced Optimization  3 Credit Hours
This course will cover selected advanced optimization methods for engineering disciplines and information systems. Topics include nonlinear programming, network optimization, dynamic programming and optimal control. Theories related to optimality and convergence, population-based optimization, etc. will be covered. Students will be expected to write computer program code to implement optimization methodologies.
Prerequisite(s): IMSE 500
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 606  Advanced Stochastic Processes  3 Credit Hours
This course introduces the theory and applications of discrete and continuous stochastic processes and models. The topics include Poisson process, renewal theory, discrete-time and continuous-time Markov chains, martingales, random walks, and Brownian motion. Other Markov processes with applications to queuing, simulation, and operations research in manufacturing and service systems will also be covered.
Prerequisite(s): IMSE 510
Restriction(s):
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if College is Engineering and Computer Science

IMSE 610  Adv Top Enterprise Info Sys  3 Credit Hours
This course introduces advanced topics in the development, management and improvement of information systems in the context of supporting large enterprises. It covers emerging issues and solutions in modeling, IT infrastructure and technologies, critical enterprise functions, knowledge engineering, security and governance of enterprise information systems. It focuses on the changing requirements posed by the dynamics of their residing environment and information technology.
Prerequisite(s): IMSE 5715
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate

IMSE 659  Advanced System Simulation  3 Credit Hours
Simulation with animation packages using contemporary software such as SIMAN/CINEMA or SLAM/TESS. Topics in simulation methodology: random number generation and testing, distribution sampling, validation are reviewed. Emphasis on output analysis, design of simulation experiments, variance reduction techniques, expert systems in simulation.
Prerequisite(s): IMSE 459 and IMSE 559

IMSE 682  Seminar in Comp Proc Contl  3 Credit Hours
Advanced treatment of the design of process control systems with emphasis on the modeling of a process of computer control and the design and analysis of a control strategy. Each student is expected to select a project and design and program the control strategy or support software on a mini-computer.
Prerequisite(s): IMSE 582

IMSE 699  Master's Thesis Project  1 to 6 Credit Hours
Graduate students electing this course, while working under the general supervision of a member of the department faculty, are expected to plan and conduct the work themselves, to submit a thesis for review and approval, and to present an oral defense of the thesis.
Restriction(s):
Can enroll if Class is Graduate

IMSE 980  Ph.D. diss research precand  1 to 9 Credit Hours
Full Title: Ph.D. dissertation research pre-candidate Dissertation research by a pre-candidate student of the Ph.D. in Industrial and Systems Engineering (I&SE) Program conducted under guidance of the faculty advisor. The credits earned in this dissertation research course count towards (fulfill) 24 credit hours of dissertation research requirements of the Ph.D. I&SE program. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is Industrial & Systems Engin

IMSE 990  PHD Dis Research Cand  1 to 9 Credit Hours
Full Title: Ph.D. dissertation research candidate Dissertation research by a candidate student of the Ph.D. in Industrial and Systems Engineering Program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is Industrial & Systems Engin

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Mechanical Engineering
A candidate for the Master of Science in Engineering (Mechanical Engineering) must meet the requirements for the Bachelor of Science in Engineering (Mechanical Engineering) degree at this campus or the essential equivalent to these requirements. The candidate must then complete at least 30 credit hours of graduate work approved by the program advisor/graduate committee with an average grade of at least B covering all courses elected. These 30 credit hours must include two graduate-level cognate courses for a minimum of three credit hours each in a department other than mechanical engineering. Students are not permitted to elect more than two courses outside mechanical engineering.

Students who have not fulfilled the requirements of the bachelor's degree in mechanical engineering should communicate with the department graduate committee regarding the requirements to be met.

Program Requirements
Within the broad framework given above, the student must elect courses to fulfill the following distribution requirements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 518</td>
<td>Advanced Engineering Analysis</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Four courses from Group A and/or Group B</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>One mathematics or math-related cognate course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>One non-ME 500-level cognate course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Two-three ME graduate courses as Electives</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Thesis optional:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 credit hours, to be deducted from Electives area.</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours 30
Must be taken within the first two terms of enrollment.

Optional: An additional non-mechanical engineering course (any 500-level non-ME course in an engineering discipline, excluding engineering management courses.

6-9 credits of electives, depending on the number of cognate courses completed.

**Group A: Mechanical Science Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 510</td>
<td>Finite Element Methods</td>
<td>3</td>
</tr>
<tr>
<td>ME 512</td>
<td>Structural Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 514</td>
<td>Advanced Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 515</td>
<td>Advanced Mechanics of Solids</td>
<td>3</td>
</tr>
<tr>
<td>ME 516</td>
<td>Special Topics in Mech Eng</td>
<td>3</td>
</tr>
<tr>
<td>ME 519</td>
<td>Basic Comp Methods in Eng</td>
<td>3</td>
</tr>
<tr>
<td>ME 540</td>
<td>Mechanical Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>ME 542</td>
<td>Advanced Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 543</td>
<td>Vehicle Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 545</td>
<td>Acoustics and Noise Control</td>
<td>3</td>
</tr>
<tr>
<td>ME 547</td>
<td>Powertrains I</td>
<td>3</td>
</tr>
<tr>
<td>ME 548</td>
<td>Automotive Powertrains II</td>
<td>3</td>
</tr>
<tr>
<td>ME 554</td>
<td>Theory of Gearing and Applicat</td>
<td>3</td>
</tr>
<tr>
<td>ME 556</td>
<td>Stress and Stren Cons in Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 558</td>
<td>Fracture and Fatig Cons in Des</td>
<td>3</td>
</tr>
<tr>
<td>ME 560</td>
<td>Experimental Methods in Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 563</td>
<td>Advanced Instrum and Control</td>
<td>3</td>
</tr>
<tr>
<td>ME 564</td>
<td>Linear Systems Control</td>
<td>3</td>
</tr>
<tr>
<td>ME 565</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
<tr>
<td>ME 567</td>
<td>Reliability Consid in Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 570</td>
<td>Powertrain NVH of Elect Veh</td>
<td>3</td>
</tr>
<tr>
<td>ME 576</td>
<td>Battery Sys Modeling &amp; Ctrl</td>
<td>3</td>
</tr>
<tr>
<td>ME 580</td>
<td>Advanced Engineering Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 582</td>
<td>Injection Molding</td>
<td>3</td>
</tr>
<tr>
<td>ME 583</td>
<td>Mechanical Behav of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 584</td>
<td>Mechanical Behavior of Polymer</td>
<td>3</td>
</tr>
<tr>
<td>ME 585</td>
<td>Cast Metals in Eng Design</td>
<td>3</td>
</tr>
<tr>
<td>ME 586</td>
<td>Materials Consid in Manufactur</td>
<td>3</td>
</tr>
<tr>
<td>ME 587</td>
<td>Automotive Composites</td>
<td>3</td>
</tr>
<tr>
<td>ME 589</td>
<td>Composite Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 591</td>
<td>Degradation of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 593</td>
<td>Powder Materials &amp; Processing</td>
<td>3</td>
</tr>
<tr>
<td>ME 595</td>
<td>Digital Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>ME 610</td>
<td>Finite Elem Methods –Nonlinear</td>
<td>3</td>
</tr>
<tr>
<td>ME 611</td>
<td>Modeling of Engr Mats</td>
<td>3</td>
</tr>
</tbody>
</table>

**Thesis and Independent Study**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 600</td>
<td>Study or Res in Sel Mech Eng</td>
<td>1-3</td>
</tr>
<tr>
<td>ME 601</td>
<td>Exper Research in Mech Eng</td>
<td>1-3</td>
</tr>
<tr>
<td>ME 602</td>
<td>Guided Study in Mech Eng</td>
<td>1-6</td>
</tr>
<tr>
<td>ME 699</td>
<td>Master’s Thesis</td>
<td>1-6</td>
</tr>
</tbody>
</table>

Students must earn a B or better in every graduate course to be credited toward the degree requirements. However, a maximum of one grade of B- will be accepted. In addition, students must maintain a cumulative GPA of 3.0 or higher.

In order to be admitted as an applicant for the master’s degree, students must satisfy the graduate committee of the department that they have completed preparation equivalent to the undergraduate degree requirements in this department and that they are prepared to undertake the advanced courses. In general, the applicants must have maintained B averages as undergraduates. Students will not be given graduate credit for courses equivalent to any which they have been required to take for the bachelor’s degree or for courses required in the undergraduate curriculum of this department.

**Group B: Thermal/Fluid Science Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 516</td>
<td>Special Topics in Mech Eng</td>
<td>3</td>
</tr>
<tr>
<td>ME 521</td>
<td>Dyn and Therm of Comp Flow</td>
<td>3</td>
</tr>
</tbody>
</table>

**ME 522** Advanced Fluid Mechanics 3 Credit Hours

**ME 525** Computational Thermo-Fluids 3 Credit Hours

**ME 528** Fund of Boiling and Condensat 3 Credit Hours

**ME 531** Statistical Thermodynamics 3 Credit Hours

**ME 532** Combustion Processes 3 Credit Hours

**ME 535** Advanced Thermodynamics 3 Credit Hours

**ME 537** Automotive Air Conditioning 3 Credit Hours

**ME 538** Vehicle Thermal Management 3 Credit Hours

**ME 552** Sustainable Energy Systems 3 Credit Hours

**ME 571** Conduction Heat Transfer 3 Credit Hours

**ME 572** Convection Heat Transfer 3 Credit Hours

**ME 573** Radiative Transport of Heat 3 Credit Hours

**ME 577** Energy Conversion 3 Credit Hours

**ME 592** Fuel Cells 3 Credit Hours

**ME 596** Internal Combustion Engines I 3 Credit Hours

**ME 597** Internal Combustion Engines II 3 Credit Hours

**ME 598** Engine Emissions 3 Credit Hours

**ME 622** Adv Topics in Fluid Mechanics 3 Credit Hours

**ME 600** Study or Res in Sel Mech Eng 1-3 Credit Hours

**ME 601** Exper Research in Mech Eng 1-3 Credit Hours

**ME 602** Guided Study in Mech Eng 1-6 Credit Hours

**ME 699** Master’s Thesis 1-6 Credit Hours
ME 512 Structural Analysis 3 Credit Hours
Advanced treatment of dynamic structural theories. Topics covered include: Rayleigh and Timoshenko beams and plates; free and forced vibration response of structural components; static and dynamic stability; and impact.
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 514 Advanced Stress Analysis 3 Credit Hours
Stresses and deformations in mechanical and structural elements and systems; theory, analysis and applications. Topics selected from among the following in applied elasticity and advanced mechanics of materials: stress and strain transformation; plane theory of elasticity and stress functions; energy methods; thick-walled cylinders and spinning disks; torsion of non-circular and hollow sections; unsymmetric bending and shear center; curved beams; beams on elastic foundations; plates and shells; elastic stability. Graduate standing or permission of instructor. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 515 Advanced Mechanics of Solids 3 Credit Hours
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 516 Special Topics in Mech Eng 1 to 3 Credit Hours
Selected topics pertinent to mechanical engineering. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 518 Advanced Engineering Analysis 3 Credit Hours
The course emphasizes the exact methods used in the solution of the partial differential equations that arise in advanced engineering problems. Examples are taken from heat transfer, fluid dynamics, solid mechanics, electromagnetic theory, vibrations, etc. Linear integral equations, time dependent boundary conditions, nonlinear boundary conditions, and other topics. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 519 Basic Comp Methods in Eng 3 Credit Hours
An introduction to basic numerical methods in engineering. Topics covered include solutions of linear and nonlinear algebraic equations, solution of initial and boundary value problems in engineering by shooting, finite-difference and transformation techniques, computer-aided perturbation, numerical inversion of Laplace transformation. Finite-element methods. Solutions of partial differential equations. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 520 Dyn and Therm of Comp Flow 3 Credit Hours
Review of basic equations of fluid mechanics and thermodynamics in control volume form. One-dimensional, compressible flow involving area change, normal shocks, friction, heat transfer, and combined effects. Two-dimensional supersonic flow including linearization, method of characteristics, and oblique shocks. One-dimensional, constant area, unsteady flow. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Mechanical Engineering

ME 521 Dyn and Therm of Comp Flow 3 Credit Hours
Graduate level course of fluid mechanics. Review of fluid flow phenomena based on common principles of transfer of mass, momentum, and energy. Introduction of the fundamental concepts and methods of analysis of fluid flows in industrial and environmental settings. Navier Stokes equations; viscous and inviscid flows; laminar and turbulent flows; boundary layers; drag; thermal convection. Prerequisite: Full course of undergraduate thermodynamics, fluid dynamics, and heat transfer. Course is the equivalent of ME 520. Students who have already taken ME 520 with a grade of B or better will not receive additional credit for ME 522. (W,YR)
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 522 Advanced Fluid Mechanics 3 Credit Hours
Prerequisite(s): ME 518
Restriction(s): ME 518
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 525 Computational Thermo-Fluids 3 Credit Hours
ME 528  Fund of Boiling and Condensation  3 Credit Hours
An introduction to the basic elements of condensation and vaporization processes. Topics cover fundamentals such as gas-liquid interfacial phenomena; phase stability and nucleation; two phase flow regimes, and critical heat flux. The course also includes special topics and applications such as convective vaporization and condensation in heat transfer equipment. Three Lecture hours per week.
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 531  Statistical Thermodynamics  3 Credit Hours
Introduction to statistical methods of evaluating thermodynamic and transport properties. Elements of quantum mechanics, statistical mechanics, and kinetic theory, as applied to engineering thermodynamics. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 532  Combustion Processes  3 Credit Hours
Prerequisite(s): ME 371*
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 535  Advanced Thermodynamics  3 Credit Hours
Advanced treatment of engineering thermodynamics as applied to producing mechanical power and refrigeration. Involves rigorous application of the first and second laws. Topics to be discussed are energy/entropy generation, thermodynamics relations, nonreacting mixtures, and reacting mixtures. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 538  Vehicle Thermal Management  3 Credit Hours
This course covers fundamental thermo-fluid principles and advanced topics in thermal management of conventional and electric drive vehicles (EDVs). The topics include: principles of energy conservation, heat transfer, and fluid mechanics; vehicle thermal management system and components; electrification of vehicle thermal management system; EDV thermal management; battery thermal management in EDVs; and waste energy recovery.
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 540  Mechanical Vibrations  3 Credit Hours
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, , Bioengineering, Mechanical Engineering

ME 542  Advanced Dynamics  3 Credit Hours
An advanced treatment of analytical mechanics for particles, systems of particles and rigid body motions with special emphasis on three-dimensional motion. Lagrange's equation of motion will be introduced and utilized in the analysis of multiple-mass systems. Computer methods will be covered. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, , Bioengineering, Mechanical Engineering

ME 543  Vehicle Dynamics  3 Credit Hours
A treatment of the response, ride, and maneuvering of motor vehicles. Road loads, suspension systems, mechanics of pneumatic tires.
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 545  Acoustics and Noise Control  3 Credit Hours
Fundamentals of acoustical waves, sound propagation and intensity, instruments for vibration and noise, HVAC system noise, automobile and aircraft noise, noise control techniques. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering
ME 547  Powertrains I  3 Credit Hours
Topics in vehicle powertrain kinematics and dynamics, engine output characteristics, vehicle road load analysis, engine-transmission matching, design and analysis of gears and gear systems, planetary gear trains, design of powertrain components, clutch design and analysis, transmission design and analysis, torque and ratio analysis of automatic transmissions. (YR).
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 548  Automotive Powertrains II  3 Credit Hours
Simulation of vehicle performance; dynamics in gear shifting; engine balance, fuel economy, and performance related to powertrains; powertrain arrangements, manual and automatic transmissions, automotive axles, four-wheel-drive systems; design and manufacturing of gearing systems.
Prerequisite(s): AENG 547 or ME 547
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 552  Sustainable Energy Systems  3 Credit Hours
The course provides an overview of energy technology from a broad perspective that encompasses technical and environmental aspects. It covers a wide range of traditional and alternative energy sources and presents assessments of their availability, sustainability, and environmental impacts as well as evaluation of their potential role in solving the global energy problem. Course work includes project.
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 554  Theory of Gearing and Application  3 Credit Hours
The course emphasizes the theory and methodology for the design, manufacturing and analysis of gears and other engineering surfaces. Topics include differential geometry, kinematics of conjugate motions, surface enveloping, curvatures, cutter design, machine tool settings, simulation of machining process, tooth contact analysis, geometry modeling and design of power transmissions. Graduate standing or special permission. (YR)
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 556  Stress and Strength Cons in Design  3 Credit Hours
Treatment of stress and strength aspects of machine design. Analytical and experimental determination of stresses in machine members. Evaluation of strength under steady and fatigue loadings. Post-yield behavior, residual stress, temperature and corrosion effects. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 558  Fracture and Fatigue Cons in Design  3 Credit Hours
A comprehensive review of fracture and fatigue processes in engineering materials with emphasis on mechanics instead of mechanisms of failure. Design methodology based on fracture toughness and fatigue crack propagation is presented. Laboratory test methods and data interpretations are also presented. Graduate standing or permission of instructor. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 560  Experimental Methods in Design  3 Credit Hours
Planned experiments and their statistical analysis. Emphasis on application in life and strength testing. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 563  Advanced Instrumentation and Control  3 Credit Hours
Analysis of design techniques in modern control theory are presented. State space concepts, digital control, and adaptive control methods are covered, along with information on practical implementation problems experienced with these control techniques. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Level is Rackham or Graduate
Can enroll if Major is Mechanical Engineering-NCFD, , Bioengineering, Mechanical Engineering

ME 564  Linear Systems Control  3 Credit Hours
This course covers fundamental properties of linear dynamic systems. Topics include linear space, linear operators, Eigen-values/vectors, canonical form, representation, solution of state equations, stability, controllability, observability, design of state feedback control and development of observers with application examples in mechanical engineering. (OC)
Restriction(s):
Can enroll if Level is Rackham or Graduate or Doctorate
Can enroll if Major is Mechanical Engineering

ME 565  Mechatronics  3 Credit Hours
Mechatronics, as an engineering discipline, is the synergistic combination of mechanical engineering, electrical engineering, control engineering, and computer science, all integrated through the design process. The course is to establish a working familiarity with the key engineering elements in the design and control of electro-mechanical systems in general and automotive systems in particular. The key engineering elements include microprocessor technology, electronics, sensors and actuators, data communication and interface, control algorithms, and mechanisms of machine elements. The course is to introduce a design methodology in an integrated system environment through case studies and design projects. (AY).
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering
ME 567  Reliability Consid in Design  3 Credit Hours
Theory and application of common statistical distributions to the analysis of both life and strength data for components. Introduction to system reliability. Emphasis on use of digital computer in reliability simulation and analysis. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 570  Powertrain NVH of Elect Veh  3 Credit Hours
This course focuses on the Noise, Vibration and Harshness (NVH) characteristics of Electric Vehicles (EV), Hybrid Electrical Vehicles (HEV), and Plug-In Electric Vehicles (PHEV). Topics include principles of mechanical vibration and acoustics, driveline induced noise/vibration from both conventional internal combustion engine and electrical motor/generator, cooling fan noise, regenerative braking system and electrical accessory noise. The potential countermeasures for typical noise/vibration sources will be presented. The course consists of classroom lectures and experimental laboratory sessions. The laboratory sessions will provide the student with hands-on experience on noise/vibration measurements and analyses. The student will be required to carry out a course project on NVH related subject of electrified vehicles.
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 571  Conduction Heat Transfer  3 Credit Hours
Conduction heat transfer in steady and transient state, including heat sources. Analytical, numerical, graphical, and analog methods of solution for steady and fluctuating boundary conditions. Thermal stresses. Dynamics of thermal instrumentation and heat exchangers. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 572  Convection Heat Transfer  3 Credit Hours
The course is primarily concerned with the determination of the rate of heat transfer due to the transport of energy to or from surfaces by both molecular conduction processes and gross fluid movement inside channels and over external surfaces. Emphasis will be placed on basic understanding of the convection heat transfer phenomena and the necessary mathematical techniques for the solution of such problems along with engineering applications. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is Mechanical Engineering-NCFD, Bioengineering, Mechanical Engineering

ME 573  Radiative Transport of Heat  3 Credit Hours
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 574  Battery Sys Modeling & Ctrl  3 Credit Hours
Full Course Title: Battery Systems, Modeling, and Control This course will cover modeling, control, and estimation techniques for battery systems. Students will learn how electrochemical systems work and how they can be mathematically described. A simple phenomenological electrical circuit model and a detailed physics-based model that can capture diffusion dynamics will be covered. The thermal behavior of a battery system and its modeling will be covered as well. Students will learn the basic functions of battery management systems for monitoring state-of-charge, state-of-power, and state-of-health in applications to automotive and consumer electronics. (OC).
Restriction(s):
Can enroll if Level is Doctorate or Rackham or Graduate
Can enroll if Major is, Automotive Systems Engineering

ME 577  Energy Conversion  3 Credit Hours
This course covers fundamental engineering principles for converting available energy sources, renewable and nonrenewable, into other energy forms of direct utility. It may include such topics as steam and gas based power plants as well as devices for solar, wind, and hydraulic energy conversion.
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 580  Advanced Engineering Materials  3 Credit Hours
A second course in materials which expands the philosophy that all materials possess common traits which allow: (1) interchange of classes of materials to perform the same function, e.g., metals, polymers, ceramics, composites, etc.; and (2) understanding of the mechanisms of property controls in new materials. There is an attempt to provide equal representation of the science and the phenomena of engineering materials. Greater emphasis is placed on thermodynamics, stress-strain relations, multicomponent phase equilibria, and such other areas as received minimal exposure in the first course in materials. As a result of present technology trends, more time is spent on composites and achievement of design specifications through synthesis. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering
ME 582 Injection Molding  3 Credit Hours
This is an in-depth course on injection molding processes, which include the conventional injection molding process, low pressure injection molding, structural sandwich molding, gas assisted injection molding etc. Material, process and tool design parameters are emphasized. The roles of rheology and flow modeling are discussed. Design issues for injection molded products are also discussed. Injection molding applied to other materials, such as ceramics, is also described. (YR).
Restriction(s):
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 583 Mechanical Behavior of Materials  3 Credit Hours
Mechanical behavior of materials are covered in relation to their structures, deformation characteristics and failure mechanisms. Means of improving strength, fracture toughness and other mechanical properties are discussed. Environmental effects on mechanical behavior are also included. The emphasis is on metals, however, polymers and ceramics are also covered. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 584 Mechanical Behavior of Polymer  3 Credit Hours
Mechanical behavior of polymers and ceramics are considered in relation to their structures, processing and applications. Emphasis is given on their deformation, fatigue and fracture characteristics. Strengthening mechanisms for both materials are discussed. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 585 Cast Metals in Eng Design  3 Credit Hours
An understanding of the properties of the most important cast metals is obtained by melting, casting, and testing. In addition to measurement of mechanical properties, resistance to heat, wear, and corrosion is discussed. The application of these properties in the design of critical parts in the aircraft, automotive, chemical, mining, and railroad industries is presented by case histories and examination of castings. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 586 Materials Consid in Manufactur  3 Credit Hours
Manufacturability of materials and influence of processing variables on the properties of manufactured products are important considerations in materials selection and product design. These issues are addressed on the basis of mechanical deformation and thermal characteristics of materials during processing. Test methods to measure formability, castability, machinability, etc., are critically discussed. Defects in manufactured products including their origin and detection are also discussed. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 587 Automotive Composites  3 Credit Hours
The emphasis in this course is on automotive composites, such as SMC, SRIM and RTM. In addition to properties and applications of these materials, this course covers manufacturing processes, design considerations, test methods and quality control techniques used for automotive composites. The use of continuous fiber composites in automotive applications, such as leaf springs, drive shafts and energy absorbing structures, are also discussed. (YR).
Restriction(s):
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 589 Composite Materials  3 Credit Hours
This course will consider four different aspects of composite materials; namely, materials, mechanics, manufacturing and design. Recent developments on fiber reinforced plastics and metals will be covered. Fundamental analytical concepts on micro and macro mechanics will be emphasized to create a better understanding of the design principles of composite materials. Graduate standing or special permission. (YR).
Restriction(s):
Cannot enroll if Class is
Cannot enroll if Level is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 590 Degradation of Materials  3 Credit Hours
The course will introduce students to the fundamentals of corrosion and degradation behavior of materials. The degradation of metals, polymers and composites will be discussed. Monitoring and life prediction techniques will be covered. Preventive measures such as a materials selection and design, protective coating, surface treatments, inhibitors, and electrochemical techniques are applied, when they should be used, and how various techniques can be integrated to solve complex problems. (AY).
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering

ME 592 Fuel Cells  3 Credit Hours
This course covers fundamentals of fuel cell systems for both automotive and distributed power applications. Detailed descriptions of the principles and component designs of various types of fuel cells including proton exchange membrane fuel cell (PEMFC), phosphoric acid fuel cell (PAFC), solid oxide fuel cell (SOFC), and molten carbonate fuel cell (MCFC). Discussions on water and thermal management, and balance of power plant. Review of hydrogen storage and safety consideration. Challenges and future opportunities.
Restriction(s):
Cannot enroll if Class is
Can enroll if Major is , Mechanical Engineering-NCFD, Mechanical Engineering
ME 593  Powder Materials & Processing  3 Credit Hours
A lecture course that provides a comprehensive understanding of the theory and principles, the associated synthesis, processing, and characterization techniques; and the applications of powder and particulate materials. The students will gain knowledge of the following: fundamentals of powder and particulate materials (metals and ceramics), various metallic and non-metallic powder synthesis/production techniques, diverse techniques of powder characterization, and the principles and methods of homogenization, compaction, and sintering. Students will be exposed to the relevant criteria for designing parts/components based on powder and particulate materials and, will familiarize themselves with a wide range of applications as structural, functional, and biomedical components made of metallic, ceramic, and composite powders in various industries. (OC)
Restriction(s):
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 595  Digital Manufacturing  3 Credit Hours
This combined lecture and hands-on project course aims to train students to optimize the interplay of materials, people, machines, and profitability. The course introduces methods to identify product concepts with commercial potential. Student teams will perform market analysis and explore the intellectual property space around their ideas and rapidly iterate them into a final prototype via direct digital manufacturing (e.g., 3D CAD/CAM files manifested via digital printing or machining). Advanced instruction on direct digital manufacturing tools will be given, and customer response will be used as feedback. Early stage prototypes will progress into more sophisticated designs, scaling up (cost, pricing, tooling, process flow and automation) scenario planning for mass manufacturing as well as Failure Mode Effect Analysis (FMEA) will be discussed. (W,YR)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 596  Internal Combustion Engines I  3 Credit Hours
Comparison of several forms of internal combustion engines including Otto and Diesel type piston engines; performance parameters and testing; thermodynamic cycles and fuel-air cycles; combustion in SI and Diesel engines; charge formation and handling; ignition; elements of exhaust emissions. (Not available to students with ME 496 or equivalent background.)
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 597  Internal Combustion Engines II  3 Credit Hours
Fuel flow and air flow measurements and techniques; engine maps; fuel and ignition control and control strategies; combustion and burn rate considerations in engine design; intake and exhaust systems; emissions and control strategies; emission test procedures.
Prerequisite(s): AENG 596 or ME 596
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 598  Engine Emissions  3 Credit Hours
This course introduces students to the fundamentals of engine exhaust emissions, including their formation mechanisms and abatement techniques. The students will be familiarized with the present emission control technologies and future challenges. The topics covered include: engine emissions and air pollution; review of emission regulations; catalyst fundamentals; catalyst aftertreatment techniques for gasoline, diesel, and lead-burn engines; discussion of cold start emission control and breakthrough catalytic technologies. (AY).
Restriction(s):
Cannot enroll if Level is
Can enroll if Major is, Mechanical Engineering-NCFD, Mechanical Engineering

ME 600  Study or Res in Sel Mech Eng  1 to 3 Credit Hours
Individual or group study or design in an area of Mechanical Engineering under the supervision of a member of the graduate faculty. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate

ME 601  Exper Research in Mech Eng  1 to 3 Credit Hours
Laboratory investigation in an area of Mechanical Engineering under the supervision of a member of the graduate faculty. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Class is Graduate

ME 602  Guided Study in Mech Eng  1 to 6 Credit Hours
Independent study of specified material in an area of Mechanical Engineering under the guidance of a member of the graduate faculty. The student will submit a report on the project and give an oral presentation to a panel of faculty members at the close of the term.
Restriction(s):
Can enroll if Class is Graduate

ME 607  Adv Mechanical Engin Problems  3 Credit Hours
A graduate-level analytical study of selected topics in mechanical engineering. The subjects of study in each term usually depend on student and instructor interest. Typical areas of study include vibrations of continuous or lumped systems, fluid mechanics, devices, thermodynamics, heat transfer, mechanics of solids, materials, or processing, etc. The course can be organized to meet the subject needs of a group of students with mutual interests.
Restriction(s):
Can enroll if Class is Graduate

ME 610  Finite Elem Methods--Nonlinear  3 Credit Hours
Review of FE theory in linear static. FEA in dynamics. FEA in heat transfer. FEA in fluid mechanics. FEA in nonlinear problems; material and geometrical nonlinearities, total and updated Lagrangian formulations, solution techniques. Use of FE codes. Graduate standing or special permission. (YR).
Prerequisite(s): ME 510
Restriction(s):
Can enroll if Class is Graduate
ME 611  Modeling of Engr Matls  3 Credit Hours
Full Course Title: Modeling of Engineering Materials This course will present the mathematical models and constitutive behavior of engineering materials subjected to mechanical and non-mechanical loads. It will consider both linear and non-linear models to describe elastic, plastic, viscoelastic, viscoplastic, hypo- and hyper-elastic response of materials to mechanical loads. Non-mechanical loads will include thermal and electro-mechanical fields. Micro-scale and multi-scale mechanical modeling will also be introduced. (OC)
Prerequisite(s): ME 518
Restriction(s):
Can enroll if Level is Doctorate or Rackham or Graduate
Can enroll if Program is

ME 622  Adv Topics in Fluid Mechanics  3 Credit Hours
The course presents selected topics of contemporary advanced fluid mechanics, such as the hydrodynamic stability theory, turbulence, multi-phase flows, magnetohydrodynamics, interfacial flows, flows of non-newtonian fluids, micro- and nano-fluid mechanics, biofluid mechanics, etc.
Prerequisite(s): ME 522
Restriction(s):
Can enroll if Class is Graduate
Can enroll if Level is Rackham or Graduate or or Doctorate
Can enroll if Program is PHD-Automotive Engineering, MSE-Mechanical Engineering, MSE-Automotive Engineering

ME 640  Advanced Vibration Theory  3 Credit Hours
The course will emphasize the similarities between various types of continuous systems as well as common features of continuous and discrete systems. Variational principle will be introduced as a notion of natural modes of vibration for discrete systems is reviewed. Natural modes of vibration for continuous systems will be discussed using the boundary value formulation, the general formulation of the eigenvalue problem and orthogonality. These concepts will be applied to bars, rods, membranes, and plates. Approximate methods will be introduced to determine the natural modes of vibration for complex continuous systems. A few methods to be considered include the Rayleigh-Ritz, Galerkin, Collocation, Myklestad, and Lumped-parameter methods. All the approximate methods presented will allow expedient numerical solution by means of high-speed computers. The damped and undamped response to deterministic excitations will be considered for various systems. Graduate standing or special permission. (YR).
Prerequisite(s): ME 540
Restriction(s):
Can enroll if Level is Rackham or Graduate

ME 642  Simulation of Mechanic Systems  3 Credit Hours
Analysis, synthesis, and optimization of linear, multilinear and nonlinear mechanical systems with the electronic analog computer. Graduate standing or special permission. (YR).
Prerequisite(s): ECE 365
Restriction(s):
Can enroll if Level is Rackham or Graduate

ME 675  Predictive Control of Dynamic Systems  3 Credit Hours
This course covers predictive control of dynamic systems to students working on controls. The topics will include unconstrained and constrained optimization, discrete-time optimal control problems, dynamic programming, stability, invariance, reachability, and linear predictive control problems with application examples in mechanical engineering. (OC).
Prerequisite(s): ME 564 or ECE 560

ME 699  Master's Thesis  1 to 6 Credit Hours
Graduate students electing the course, while working under the general supervision of a member of the department faculty, are expected to plan and carry out the work themselves and submit a thesis for review and approval, and also present an oral defense of the thesis. Students must satisfactorily complete 6 credit hours in ME 699, but these hours may be spread over more than one term. Graduate standing or special permission. (YR).
Restriction(s):
Can enroll if Class is Graduate

ME 791  Adv Guided Research  1 to 6 Credit Hours
Independent study and research work on the material related to the doctoral research project under the guidance of the faculty advisor. The course is for doctoral students who have not completed the PhD program's coursework requirements. A report and an oral presentation are required. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate
Can enroll if College is Engineering and Computer Science
Can enroll if Major is Mechanical Engineering

ME 798  Doctoral Seminar  0 Credit Hours
The course is for doctoral students who have not completed the PhD program's coursework requirements. A report and an oral presentation are required. (F,W,S)
Restriction(s):
Can enroll if Level is or Doctorate
Can enroll if Major is

ME 980  Pre-Cand Dissertation Research  1 to 9 Credit Hours
Full Title: Pre-Candidate Dissertation Research Dissertation work by a pre-candidate student in Mechanical Sciences and Engineering program conducted under guidance of the faculty advisor. (F,W,S)
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is

ME 990  Doctoral Dissertation  1 to 9 Credit Hours
Dissertation work by a student of the Ph.D. in Mechanical Sciences and Engineering program conducted under guidance of the faculty advisor. The student must be admitted to the Ph.D. candidacy status.
Restriction(s):
Can enroll if Level is Doctorate or
Can enroll if Major is

* An asterisk denotes that a course may be taken concurrently.

Frequency of Offering
The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally

Mechanical Sciences and Engineering

The Ph.D. program in Mechanical Sciences and Engineering at the University of Michigan-Dearborn educates and trains talented students who will conduct original and innovative research in the engineering field, educate future generations, and play leading roles in developing cutting edge technologies while working in industry, academia, and government. The doctoral program has a strong orientation toward the
interfaces between the science of mechanical engineering and other areas. In addition to the core mechanical engineering subfields, such as mechanical and thermo-fluid sciences, the program’s areas of research training include the emerging fields in which mechanical engineering intersects with the materials sciences, bioengineering, automotive engineering, optical engineering, and advanced energy technologies.

The Ph.D. program is highly selective and offers admission to exceptional students who have completed a Bachelor’s or Master’s degree in engineering, applied math, computer science, or physical science.

All students admitted for full-time study receive a competitive financial aid package in the form of an appointment as a graduate student instructor (GSI) or research assistant (GSRA).

All admissions are for the Fall term only.

If you have additional questions, please contact the program chair: D. Do Ho Jung (https://umdearborn.edu/users/dohan/).

The specific learning goals of the program are that the graduates will have:

• A strong foundation in engineering science and deep knowledge of the chosen field
• The ability to conduct high-quality original research in the broad field of Mechanical Sciences and Engineering
• The ability to communicate and disseminate their knowledge to a broader audience
• Preparedness for varied responsibilities and opportunities of careers in industrial research and academia.

Ph.D. in Mechanical Sciences and Engineering

The MSE Ph.D. degree requirements include a minimum of 36 credits of coursework and 24 credit hours of dissertation for Ph.D. students. The implementation of the requirements is, by necessity, different for the three major student profiles:

1. Direct Ph.D. students, who are admitted with a Bachelor’s degree in mechanical engineering or a closely related field, but without a relevant Master’s degree. Students of this group must complete no fewer than 36 credit hours of coursework, 30 of which allow them to earn an embedded MSE in mechanical engineering degree.
2. Students admitted with a relevant Master’s degree (in mechanical engineering or the discipline of the student’s Master’s studies) to the same narrow field of studies (presumably the field of the student’s research work) and include a higher-level course that continues the ideas of a lower-level course.
3. Students admitted with a relevant non-Rackham (i.e., from outside the University of Michigan system) Master’s degree. These students must satisfy the requirement of coursework in residence by completing no fewer than 18 credit hours of coursework.

For students entering with insufficient background in mechanical engineering and essential sciences, such as mathematics, physics, and chemistry, remedial coursework is assigned, which does not count toward the degree requirements.

The completed coursework must satisfy the minimum degree requirements specified below. Only letter-graded courses at the 500+ level will be allowed.

Each student is guided by a research advisor and a dissertation committee and must pass the following major milestones:

• Completion of required coursework
• Qualifying examination consisting of two parts:
  • Curriculum examination
  • Research fundamentals examination
• Dissertation proposal examination and advancement to candidacy
• Preparation of a written dissertation and its oral defense

Degree Requirements

For students admitted on the basis of a Master’s degree, some of the requirements can be satisfied by the coursework completed during the Master’s studies. This should be approved by the Ph.D. program committee and does not reduce the required total number of credits within the program.

GPA Requirement

To advance to candidacy, a student must have a cumulative GPA (Grade Point Average) of 3.5 or above on the 4.0-scale. Courses completed with a grade lower than 3.3 (B+) do not count toward the degree requirements.

Breadth Requirement

This requirement is for direct Ph.D. students only.

A student must take no fewer than two courses (6 credit hours) in each of the two major course groups.

1. Mechanical Sciences

   ME 510 || 3
   ME 512 || 3
   ME 514 || 3
   ME 515 || 3
   ME 519 || 3
   ME 540 || 3
   ME 542 || 3
   ME 543 || 3
   ME 545 || 3
   ME 547 || 3
   ME 548 || 3
   ME 554 || 3
   ME 556 || 3
   ME 558 || 3
   ME 560 || 3
   ME 563 || 3
   ME 565 || 3
   ME 567 || 3
   ME 570 || 3
   ME 580 || 3
   ME 582 || 3
   ME 583 || 3
   ME 584 || 3
   ME 585 || 3
   ME 586 || 3
   ME 587 || 3
   ME 589 || 3
   ME 591 || 3
   ME 593 || 3
   ME 595 || 3
   ME 610 || 3
   ME 640 || 3

2. Thermal/Fluid Sciences

   ME 521 || 3
   ME 522 || 3
   ME 525 || 3
   ME 528 || 3
   ME 531 || 3
   ME 532 || 3
   ME 535 || 3
   ME 537 || 3
   ME 538 || 3
   ME 552 || 3
   ME 571 || 3
   ME 572 || 3
   ME 573 || 3
   ME 577 || 3
   ME 592 || 3
   ME 596 || 3
   ME 597 || 3
   ME 598 || 3
   ME 622 || 3

Depth Requirement

A least two courses (6 credit hours) must be in a sequence, i.e., belong to the same narrow field of studies (presumably the field of the student’s research work) and include a higher-level course that continues the ideas of a lower-level course.

Cognate Requirement

At least 4 credit hours of coursework must be outside the mechanical engineering area. The second mathematics class (see below) can be used to satisfy all or part of this requirement.

Other ways of satisfying this requirement with some restrictions are:

• Engineering courses of 500+ level in a discipline other than mechanical engineering or the discipline of the student’s Master’s studies
• Other 500+ level courses, if approved by the program committee
• Completion of a University of Michigan Master’s degree, which includes a cognate component
• Completion of a relevant Master’s degree from another university which had coursework that meets the expectations of the program cognate requirement, without transferring the credit to the transcript

No more than 6 credit hours of cognate courses can be counted towards the degree requirement.

**Directed Study Requirement**
At least 6 credit hours of research coursework, guided by the student’s research advisor, must be completed within the first two years of enrollment in the program. ME 600 (Study or Research in Selected ME Topics), ME 601 (Experimental Research in Mechanical Engineering), ME 602 (Guided Study in Mechanical Engineering), or ME 699 (Master’s Thesis*) can be used for this purpose.

* Can be used by direct Ph.D. students only.

**Elective Requirement**
The remaining coursework must be in graduate-level engineering, mathematics, or natural sciences courses.

**Methodology Seminar**
This course must be completed within the first two semesters of enrollment in the program. The seminar includes required training in responsible conduct of research and scholarship. The seminar carries no credit hours. Passing is based on participation and attendance, with the exception of the responsible conduct of a research and scholarship training module, for which a test is required.

**Ph.D. Research Seminar**
Attendance at this seminar is required for all Ph.D. students, including those at the pre-candidacy level, during each semester they are enrolled in the program. The seminar carries no credit hours and is graded pass/fail based on attendance and participation.

**Advanced Mathematics Requirement**
ME 518 (Advanced Engineering Analysis, 3 credit hours) must be taken within the first two semesters of enrollment in the program. A second graduate-level mathematics or mathematics-related class of no fewer than 3 credit hours must also be taken.

ME 518[3]
A list of approved advanced mathematics courses is presented below. It is acceptable to use advanced mathematics courses to meet the cognate course requirement.


**Qualifying Examination**
The qualifying examination consists of two parts to be taken in sequence:
• Part 1 – Curriculum Examination
• Part 2 – Research Fundamentals Examination

A student must be in good standing (GPA of at least 3.5) and is given two attempts to pass each part. The time limits to complete the examination after enrollment in the program are two years for full-time students and three years for part-time students.

The examination committee consists of 3 faculty members appointed by the program committee, none of whom is the student’s research advisor.

**Curriculum Examination**
The goal of this examination is to ensure that students have good understanding of the fundamentals of mechanical sciences and engineering in the broad area of their research. The examination must be completed within the first three semesters of enrollment in the program and has two components:

1. Good performance in three courses selected during the first semester of enrollment in the program. The courses must be passed with grades not lower than 3.7 (A-).
2. A written examination on the material of one of these courses and the underlying undergraduate material.

**Research Fundamentals Examination**
This oral examination follows a successfully passed curriculum examination and, as a rule, occurs in the same or following semester. The objective is to ensure that a student has the necessary educational background and skills to conduct independent research in the selected area. The examiners test such aspects of the student’s preparedness as:

• Depth and clarity of understanding in the selected area
• Ability to make independent logical conclusions
• Problem solving skills and creativity
• Communication skills.

**Dissertation Proposal and Advancement to Candidacy**
The last step of advancement to candidacy is the dissertation proposal examination, the main objective of which is to ensure sufficient strength and feasibility of the proposed research topic, as well as the suitability of the student’s background and skills regarding the topic. The examination must be completed within a year of passing the qualifying examination.

The examination consists of a written dissertation proposal and its open-to-the-public presentation by the student. The examination is conducted by the dissertation committee. As a rule, the dissertation committee continues overseeing the student's work to the stage of final dissertation defense.

**Dissertation Defense**

**Dissertation Committee**
The dissertation committee consists of the chair and three members. The student’s dissertation advisor serves as chair. Of the three additional members, two must hold at least a 50 percent appointment as tenured or tenure-track faculty of the mechanical engineering department, with at least one being a member of the graduate faculty. The third committee member must be from outside the ME department—a faculty member from another department or another university, or an expert from industry.

The composition of the dissertation committee must be approved by the Ph.D. program committee.
Dissertation and Final Defense
Upon completion of the dissertation work, the student initiates the last step toward the degree—the dissertation defense process. The process follows the official guidelines and consists of the following main stages:

1. Preparation of a written dissertation formatted in accordance with the guidelines
2. Pre-defense meetings with the members of the program committee
3. Written evaluations of the dissertation by the dissertation committee members presented to the Ph.D. program committee
4. Oral defense of the dissertation consisting of two parts:
   • Public seminar and open question session held by the student
   • Private examination of the student by the members of the dissertation committee
5. Final oral examination report and certificate of approval prepared by the dissertation committee and submitted to the Ph.D. program committee

Time Limit for Completing the Degree
Full-time students must achieve candidacy within three years of enrolling in the program and complete the degree within five years of achieving candidacy. The total time for completing the degree is limited to seven years after enrolling in the program. Extensions of the time limits in justified cases are handled in accordance to the program guidelines.

Plastic and Composite Materials
Students in this certificate program will be exposed to both design and manufacturing considerations of plastics and composite materials. Particular emphasis will be given to the materials for automotive applications. Processes, properties and design of the materials will be examined, and characteristics of the materials manufactured from different processes will be discussed. (12 credit hours)

Program Requirements
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 582</td>
<td>Injection Molding</td>
<td>3</td>
</tr>
<tr>
<td>ME 584</td>
<td>Mechanical Behavior of Polymer</td>
<td>3</td>
</tr>
<tr>
<td>ME 587</td>
<td>Automotive Composites</td>
<td>3</td>
</tr>
<tr>
<td>ME 589</td>
<td>Composite Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

Program and Project Management
The program may be completed entirely on campus, entirely online, or through a combination of on-campus and online courses.

Admission
Admission to the program as a regular student requires a BS in engineering, business, economics, math, computer science or other physical sciences and at least two years of practical work experience. The prerequisite for the program is the course work in probability and statistics that can be satisfied by completing IMSE 510 as part of approved electives within the first two semesters of the admission into the program. Two letters of recommendation, with at least one from a person familiar with the candidate’s academic performance, are also required.

The undergraduate cumulative GPA is a large factor in master’s admission consideration and typically 3.0 (on a scale of 4.0) is expected.

Advanced Standing
Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution.

Minimum Grade Requirement in addition to maintaining a minimum cumulative GPA of 3.0 or higher every semester:
1. Courses in which grades of C- or below are earned cannot be used to fulfill degree requirements.
2. No more than two courses in which grades of B- or below are earned can be used to fulfill degree requirements.

A minimum of a 3.0 cumulative GPA or higher is required at the time of graduation.

Program Requirements
The program of study must satisfy the following distribution and course requirements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 517</td>
<td>Managing Global Programs</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5205</td>
<td>Eng Risk-Benefit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 590</td>
<td>Capstone Project</td>
<td>3</td>
</tr>
<tr>
<td>OB 510</td>
<td>Organization Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives (9 credit hours)

Approved electives:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 505</td>
<td>Devel &amp; Interp Financial Info</td>
</tr>
<tr>
<td>CIS 575</td>
<td>Software Engineering Mgmt</td>
</tr>
<tr>
<td>EMGT 500</td>
<td>Management for Engineers</td>
</tr>
<tr>
<td>EMGT 525</td>
<td>Tot Qua Mgmt and Six Sigma</td>
</tr>
<tr>
<td>EMGT 520</td>
<td>Prod &amp; Oper Engineering I</td>
</tr>
<tr>
<td>EMGT 580</td>
<td>Mgt of Prod and Proc Design</td>
</tr>
<tr>
<td>HRM 561</td>
<td>Human Resource Management</td>
</tr>
<tr>
<td>IMSE 510</td>
<td>Probability &amp; Statistical Mod</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
</tr>
<tr>
<td>OM 571</td>
<td>Supply Chain Management</td>
</tr>
</tbody>
</table>

Total Credit Hours 30
Additional elective courses from other units in UM-Dearborn could also be considered with advisor’s approval.

Thesis option may be elected with the approval of the graduate advisor which will count for six (6) credit hours of graduate coursework replacing capstone project (EMGT 590) and three (3) credit hours of elective coursework. Students electing a thesis option must elect at least one more graduate level cognate course in the place of EMGT 590 for a minimum of three credit hours from departments other than IMSE to satisfy.

This certificate provides practical knowledge in program and project management fundamentals. Topics include planning and organizing resources so that programs and projects are completed on schedule, on budget, and produce high-quality outcomes. The certificate is ideal for professionals who want to enhance their capabilities in managing complex projects and achieving cost-effective results. (12 credit hours)

Admission Requirements: Students who apply to this certificate program should have completed an undergraduate B.S. degree in Engineering, Business, Economics, Math, Computer Science or another physical science from an accredited institution and have at least two years of practical work experience. A probability & statistics course is a prerequisite for this certification program.

Program Requirements

Required Core Course

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Coursework

Complete 2 courses from the following (6 credits):

<table>
<thead>
<tr>
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<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSE 517</td>
<td>Managing Global Programs</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5205</td>
<td>Eng Risk-Benefit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5215</td>
<td>Program Budget, Cost Est &amp; Con</td>
<td>3</td>
</tr>
</tbody>
</table>

Robotics Engineering

The ECE Department offers a program totaling 30 credit hours, leading to the degree of Master of Science in Engineering (Robotics Engineering). Students desiring admission to the program must have earned a Bachelor’s degree in Robotics, Electrical, Computer, Mechanical, Industrial and Manufacturing Systems Engineering or Computer Science with an overall GPA of 3.0 or higher. Students whose undergraduate background is in other fields may be given conditional admission and would be required to take preparatory courses in the aforementioned fields as described in section V. Students admitted to the program are required to take courses as specified below. Students must earn a B or better in every graduate course to be credited toward the degree requirements. However, a maximum of two grades of B will be accepted. In addition, students must maintain a cumulative GPA of 3.0 or higher in every semester. Students may be placed on probation, if their cumulative GPA falls below 3.0. Finally, a cumulative GPA of 3.0 or higher is required, in order to be eligible to receive the MSE (RE) degree.

Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses Required 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECE 5001</td>
<td>Analytic and Comp Math (Required unless waived. Must be taken in the first year.)</td>
<td>3</td>
</tr>
<tr>
<td>ECE 544</td>
<td>Mobile Robots (Required for all students.)</td>
<td>3</td>
</tr>
</tbody>
</table>

Selected ONE course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 543</td>
<td>Kinem, Dynam Control Robots</td>
<td>3</td>
</tr>
<tr>
<td>ECE 545</td>
<td>Intro Robot Syst</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Courses 9 to 11 credits

Sensing and Processing

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>ECE 555</td>
<td>Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>ECE 580</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 582</td>
<td>Intro to Statistical DSP</td>
<td>3</td>
</tr>
<tr>
<td>ECE 584</td>
<td>Speech Processes</td>
<td>3</td>
</tr>
<tr>
<td>ECE 586</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 587</td>
<td>Sel Top:Image Proc/Mach Vision</td>
<td>3</td>
</tr>
<tr>
<td>ECE 588</td>
<td>Robot Vision</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 606</td>
<td>Advanced Stochastic Processes</td>
<td>3</td>
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</tbody>
</table>

Systems and Control

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 560</td>
<td>Modern Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 565</td>
<td>Digital Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 567</td>
<td>Nonlinear Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 643</td>
<td>Humanoids</td>
<td>3</td>
</tr>
<tr>
<td>ECE 644</td>
<td>Advanced Robotics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 665</td>
<td>Optimal Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 661</td>
<td>Sys Ident and Adaptive Control</td>
<td>3</td>
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</table>

Machine Learning and Reasoning

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>ECE 528</td>
<td>Cloud Computing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 537</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 574</td>
<td>Adv Sftwr Technq in Eng Appl</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5752</td>
<td>Reconfigurable Computing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 579</td>
<td>Intelligent Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5831</td>
<td>Pat Rec &amp; Neural Netwks</td>
<td>3</td>
</tr>
</tbody>
</table>

Autonomous Vehicle

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 531</td>
<td>Intelligent Vehicle Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 532</td>
<td>Auto Sensors and Actuators</td>
<td>3</td>
</tr>
<tr>
<td>ECE 533</td>
<td>Active Automotive Safety Sys</td>
<td>3</td>
</tr>
<tr>
<td>ECE 535</td>
<td>Mob Dev &amp; Ubigs Comp Sys</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 566</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5701</td>
<td>Intro to Wireless Comm</td>
<td>3</td>
</tr>
<tr>
<td>ECE 577</td>
<td>Engineering in Virtual World</td>
<td>3</td>
</tr>
<tr>
<td>ECE 679</td>
<td>Adv Intelligent Sys</td>
<td>3</td>
</tr>
</tbody>
</table>

Professional Electives

Select six credit hours
Cognates
Select 4 to 6 credit hours 4-6

Professional Electives
Students may complete the professional elective in several ways: (1) Elect the thesis ECE 699 (6 credits) to work under the supervision of a faculty advisor, (2) Take directed study by ECE 591 (3 credits) and another RE course at graduate level, (3) take another two RE courses from the list above.

Cognate Courses
Students should select a minimum of 4 and a maximum of 6 credit hours of courses from other disciplines. Some courses from outside ECE may not meet cognate requirement. Please check with the ECE Department prior to registering.

Preparatory Courses
Students with inadequate background in Robotics, Electrical, or Computer Engineering may be required to meet with the department graduate advisor to determine the need for preparatory courses.

For further information please contact:
Department of Electrical and Computer Engineering
University of Michigan-Dearborn, 4901 Evergreen Road
Room 206 ELB, Dearborn, MI 48128-2406
Tel: 313-593-5420 Fax: 313-583-6336
E-mail: umd-ecegrad@umich.edu

Software Engineering
This degree program is available both on campus and online.

Admission
Applicants for the MS in Software Engineering are required to meet the following requirements:

1. A bachelor’s degree from an accredited institution with a grade point average of B or better. An applicant with a lower GPA may be granted conditional. Preference will be given to applicants with backgrounds in computing, engineering, mathematics, or science.

2. Satisfactory completion of the following:
   a. Calculus I & II
   b. One course in probability and statistics or linear algebra
   c. Programming Language (Preferably C/C++ I & II)
   d. One course in data structures with algorithm analysis
   e. One course in microprocessors
   f. One course in computer architecture
   g. One course in operating systems

Note: Students may be admitted conditionally to make up deficiencies in 2(A-G), above. The software engineering prerequisites may be completed after admission into the program on a “conditional lack of preparation” basis or substituted by two or more years of full-time professional experience in sizeable software development projects. The program committee will determine any decision on substitutions. The applicant will be required to complete the appropriate courses within two years from the date of entrance. Prerequisite courses will not earn credit towards the MS – Software Engineering degree.

3. Two letters of recommendation, with at least one from a person familiar with the candidate’s academic performance, are required. Copies of the applicant’s undergraduate transcripts and degree must be submitted.

Degree Requirements
The MS degree in Software Engineering is a 30-credit hour graduate program. Students admitted to the program are required to complete the approved graduate courses with an average of B or better. The program of study consists of core courses, elective concentrations, a thesis/project requirement (part of which may be satisfied by additional coursework), and electives.

1 Please contact the Computer and Information Science Department about the policy on the minimum grade for a course to satisfy graduation requirements.

Advanced Standing
Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution. Students may transfer up to one-half (1/2) the minimum number of credit hours required for their master’s or professional degree from University of Michigan campuses (including Dearborn, Ann Arbor, Flint).

A student is expected to complete all work within five years from the date of first enrollment in the master’s program. A student who fails to complete requirements within five years may be withdrawn and required to apply for readmission. Students exceeding this limit must submit a petition (https://umdearborn.edu/students/academic-advising/student-petitions/) requesting additional time to complete the program. Petitions must describe in detail the amount of work remaining and a timeline for completion. You can review this policy and more on the Graduate Academic Policies page: http://catalog.umd.umich.edu/academic-policies-graduate/

Program Requirements
The 30 semester hours of required coursework are distributed as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Application Courses</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Project/Theisis Option</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECE 554  Embedded Systems</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ECE 574  Adv Sftwr Techq in Eng Appl</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Three (3) out of the following five (5) CIS courses:</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>CIS 553  Software Engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 565  Software Quality Assurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 566  Software Arch and Des Patterns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 575  Software Engineering Mgmt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 580  Data Analytics in Software Eng</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Application Courses
Choose three courses from one of the following application areas:

**Web Engineering:**
- CIS 525: Web Technology
- CIS 534: Semantic Web
- CIS 540: Foundation of Info. Sec.
- CIS 549: Software Security
- CIS 559: Prin of Social Netwk Science
- CIS 562: Web Information Management
- CIS 571: Web Services
- CIS 577: S/W User Interface Dsgn&Analys
- CIS 678: Research Advances Software Eng
- ECE 528: Cloud Computing
- ECE 570: Computer Networks

**Game Engineering:**
- CIS 515: Computer Graphics
- CIS 552: Inf Vis & Multimedia Gaming
- CIS 577: S/W User Interface Dsgn&Analys
- CIS 579: Artificial Intelligence
- CIS 580: Data Analytics in Software Eng
- CIS 587: Computer Game Design & Impl
- CIS 588: Computer Game Design II
- CIS 652: Info Visualzt & Comp Anim
- CIS 678: Research Advances Software Eng
- ECE 524: Interactive Media
- ECE 579: Intelligent Systems
- ECE 5251: MM Design Tools I
- ECE 5252: MM Design Tools II

**Data Engineering and Analytics:**
- CIS 540: Foundation of Info. Sec.
- CIS 549: Software Security
- CIS 556: Database Systems
- CIS 5570: Introduction to Big Data
- CIS 562: Web Information Management
- CIS 568/: ECE 537: Data Mining
- CIS 579: Artificial Intelligence
- CIS 5700: Advanced Data Mining
- CIS 580: Data Analytics in Software Eng
- CIS 585: Adv AI
- CIS 586: Advanced Data Management
- CIS 658: Research Advances in Data Mgt
- CIS 678: Research Advances Software Eng
- ECE 525: Multimedia Data Stor & Retr
- ECE 576: Information Engineering
- ECE 579: Intelligent Systems
- ECE 568/: Data Mining
- ECE 537: Advanced Data Mining
- ECE 570: Computer Networks
- ECE 579: Intelligent Systems

**Professional Electives**

Select six credit hours

Total Credit Hours 30

A student may elect the application area of his or her choice from CIS or ECE courses with the approval of the advisor.

A student must choose one of the two options:

i. **Project:** Students desiring to obtain project experience are encouraged to elect the directed studies ECE 591/CIS 591 (3 credit hours), or Project Course ECE 695/CIS 695 (3 credit hours) to work under the supervision of a faculty advisor, and take one additional 3-credit course listed in Sections I and II, or any other CIS/ECE
course related to the students’ project and approved by the graduate program advisor.

ii. Thesis: Students desiring to obtain research experience are encouraged to elect the thesis ECE 699/CIS 699 (6 hours) and work under the supervision of a faculty advisor.

Master’s Thesis Committee
A Master’s thesis committee consists of three full-time CIS or ECE faculty members, one of whom is the thesis advisor and requires the approval of the Software Engineering graduate committee. When deemed appropriate, the chair of the graduate committee may request the presence of an additional member from outside CIS or ECE.

Preparatory Courses
Students with inadequate background in CIS or CE may be required to meet with the department graduate advisor to determine the need for preparatory courses and to determine what courses to take prior to consideration into the Masters program.

For further information contact:
Department of Computer and Information Science
University of Michigan-Dearborn, 4901 Evergreen Road
Room 105 CIS, Dearborn, MI 48128-2406
Tel: 313-436-9145 Fax: 313-593-4256
E-mail: umd-cisgrad@umich.edu (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/software-engineering/umd-cis-office@umich.edu)

Software Engineering provides a systematic, disciplined, and quantifiable approach to the development, operation, and maintenance of software. The program includes core engineering courses plus electives chosen from a graduate introduction to software engineering, software reliability, management, interface design, and case studies. (12 credit hours)

Certificate offered on Campus and via Distance Learning

Program Requirements
Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Coursework

Complete 3 courses from the following (9 credits):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 505</td>
<td>Algorithm Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CIS 565</td>
<td>Software Quality Assurance</td>
<td>3</td>
</tr>
<tr>
<td>CIS 575</td>
<td>Software Engineering Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>CIS 577</td>
<td>S/W User Interface Dsgn&amp;Analys</td>
<td>3</td>
</tr>
<tr>
<td>CIS 580</td>
<td>Data Analytics in Software Eng</td>
<td>3</td>
</tr>
<tr>
<td>ECE 537</td>
<td>Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>ECE 552</td>
<td>Fuzzy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 574</td>
<td>Adv Sftwr Technq in Eng Appl</td>
<td>3</td>
</tr>
</tbody>
</table>

Program Requirements

Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMGT 505</td>
<td>Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 501</td>
<td>Human Factors &amp; Ergonomics</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 515</td>
<td>Fundamentals of Program Mgt</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 561</td>
<td>Tot Qual Mgmt &amp; Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 577</td>
<td>Human-Computer Interaction</td>
<td>3</td>
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</table>

Additional Coursework

Complete 1 elective course from the following (3 credit hours):

<table>
<thead>
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<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AENG 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 598</td>
<td>Energy Sys for Auto Vehicles</td>
<td>3</td>
</tr>
<tr>
<td>CIS 553</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMGT 580</td>
<td>Mgt of Prod &amp; Proc Design</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 516</td>
<td>Project Management and Control</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 546</td>
<td>Safety Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 5655</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMSE 567</td>
<td>Reliability Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>
Vehicle Electronics and Controls

The increasing use of electrical systems and electronic sensors and devices in vehicles and automobiles has resulted in new developments in this field for vehicle application. With rapid progress in battery technology, it is envisaged that electric vehicles will become more affordable and more efficient. Electric drive control requires the use of power devices which are primarily high power electronic devices. Modern vehicles will rely on both analog and digital hardware for efficient operation of the vehicle. Engineers would be required to be well versed in the design of hybrid electrical and electronic systems.

The Vehicle Electronics certificate will introduce the participants to analog and digital electronics. Starting with simple diodes and rectifiers, students will be introduced to other solid state devices that are used in electronic circuits. Participants will learn the design of amplifiers, switches and other commonly used circuits. They will also receive instruction on digital logic and the use of microprocessors. Besides featuring hands-on laboratory practice, participants will be involved in several group design projects. (12 credit hours)

Certificate offered on Campus and via Distance Learning

Coursework Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AENG 510</td>
<td>Vehicle Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>AENG 545</td>
<td>Vehicle Ergonomics I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 505</td>
<td>Intro to Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 515</td>
<td>Vehicle Electronics II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 519</td>
<td>Adv Topics in EMC</td>
<td>3</td>
</tr>
<tr>
<td>ECE 531</td>
<td>Intelligent Vehicle Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 532</td>
<td>Auto Sensors and Actuators</td>
<td>3</td>
</tr>
<tr>
<td>ECE 5462</td>
<td>Elec Aspects of Hybrid Vehicle</td>
<td>3</td>
</tr>
<tr>
<td>ECE 533</td>
<td>Active Automotive Safety Sys</td>
<td>3</td>
</tr>
</tbody>
</table>
A-Z PROGRAMS

List of Undergraduate Programs

- Bioengineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/bioengineering/), BSE
- Biological Sciences (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/biological-sciences/), BS
- Business Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/business-studies-secondary-major/)(2nd major only), AB, BS
- CIS Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/cis-mathematics/)(2nd degree only), BS
- Communications (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/communication/), AB
- Computer and Information Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/computer-information-science/), BS
- Computer Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/computer-engineering/), BSE
- Data Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/data-science/), BS
- Engineering Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/engineering-mathematics/)(2nd degree only), BSE
• History (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/history/), AB
• Individual Program of Study, (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/individual-program-study/) AB, BS
• Industrial and Systems Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/industrial-systems-engineering/), BSE
• Integrated Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/integrated-science/), BS
• Integrative Studies, (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/integrative-studies/) AB, BS
• International Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/international-studies/), AB
• Journalism and Screen Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/journalism-screen-studies/), AB
• Language Arts (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/elementary-school-certification-program/language-arts/), AB, BS, Elementary Certification
• Management (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/management/), BBA
• Manufacturing Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/manufacturing-engineering/), BSE
• Marketing (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/marketing/), BBA
• Mathematics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/mathematics/), AB, BS
• Mechanical Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/mechanical-engineering/), BSE
• Microbiology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/microbiology/), BS
• Philosophy (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/philosophy/), AB
• Physics (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/physics/), BS
• Political Science (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/political-science/), AB
• Psychology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/psychology/), AB
• Reading (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/elementary-school-certification-program/reading/), AB, Elementary Certification
• Robotics Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/robotics-engineering/), BSE
• Small Business Management (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/small-business-management/), BBA
• Social Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/social-studies/), AB (College of Arts, Sciences and Letters)
• Sociology (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/sociology/), AB
• Software Engineering (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-engineering-computer-science/software-engineering/), BS
• Special Education, (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/special-education/), AB, BS
• Supply Chain Management (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-business/supply-chain-management/), BBA
• Urban and Regional Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/urban-regional-studies/), AB
• Women's and Gender Studies (http://catalog.umd.umich.edu/archives/2019-2020/undergraduate/college-arts-sciences-letters/womens-gender-studies/), AB

List of Graduate Programs
UM-Dearborn programs (non-Rackham) include:
• Accounting (p. 879), MSA
• Applied Behavioral Analysis (p. 922), (http://catalog.umd.umich.edu/apzprograms/graduate/college-arts-sciences-letters/applied-behavior-analysis/MA
• Applied and Computational Mathematics (p. 847), MS
• Automotive Systems and Mobility, (p. 946) DEng
• Automotive Systems Engineering (p. 950), MSE
• Bioengineering (p. 951), MSE
• Business Administration (p. 884), MBA
• Business Analytics (p. 887), MS
• Community Based Education (p. 923), MA
• Computer and Information Science (p. 954), MS
• Computer Engineering (p. 965), MS
• Criminology and Criminal Justice (p. 848), MA
• Cybersecurity and Information Assurance, (p. 977) MS
• Data Science (p. 634), BS
• Early Childhood Education (p. 924), MA
• Education (p. 926), MA, EdS, EdD
• Educational Leadership (p. 933), MAEL
• Educational Technology (p. 934), MA
• Electrical Engineering (p. 981), MSE
• Energy Systems Engineering (p. 996), MSE
• Engineering Management (p. 997), MS
• Environmental Science (p. 852), MS
• Finance (p. 909), MSF
• Health Information Technology (p. 936), MS
• Human Centered Design and Engineering (p. 998), MS
• Industrial and Systems Engineering (p. 999), MSE
• Information Systems Technology (p. 1010), MS
• Information Systems (p. 912), MS
• Manufacturing Systems Engineering (p. 1014), MSE
• Marketing, (p. 916) MS
• Mechanical Engineering (p. 1021), MSE
• Program and Project Management (p. 1032), MS
• Program Evaluation and Assessment (p. 937), MA
• Psychology (p. 855), MS
• Public Administration and Policy, (p. 871) MPAP
• Science Education (p. 938), MS
• Software Engineering (p. 1034), MS
• Special Education (p. 939)
• Supply Chain Management (p. 917), MS
• Teaching (p. 940), MAT

The UM-Dearborn programs offered under the auspices of the Horace H. Rackham School of Graduate Studies (hereafter Rackham) include:

• Computer and Information Science (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/computer-information-science/), PhD
• Electrical, Electronics and Computer Engineering, (p. 993) PhD
• Industrial and Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/industrial-systems-engineering/), PhD
• Mechanical Sciences and Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/mechanical-sciences-engineering/), PhD
# ACADEMIC CALENDAR

## Fall Term 2019

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Registration Begins</td>
<td>Monday, April 1</td>
</tr>
<tr>
<td>Labor Day (Holiday)</td>
<td>Tuesday, September 2</td>
</tr>
<tr>
<td>Convocation</td>
<td>Tuesday, September 3</td>
</tr>
<tr>
<td>Classes begin</td>
<td>Wednesday, September 4</td>
</tr>
<tr>
<td>Fall Study Break</td>
<td>Monday-Tuesday, October 14-15</td>
</tr>
<tr>
<td>Thanksgiving recess begins at 5:00 pm</td>
<td>Wednesday-Sunday, November 27-December 1</td>
</tr>
<tr>
<td>Classes resume</td>
<td>Monday, December 2</td>
</tr>
<tr>
<td>Classes end</td>
<td>Tuesday, December 10</td>
</tr>
<tr>
<td>Study Days</td>
<td>Wednesday, December 11</td>
</tr>
<tr>
<td>Examinations</td>
<td>Thursday-Friday, December 12-13</td>
</tr>
<tr>
<td>Examinations</td>
<td>Monday-Wednesday, December 16-15</td>
</tr>
<tr>
<td>Commencement</td>
<td>Saturday, December 14</td>
</tr>
</tbody>
</table>

1 Check umdearborn.edu/registration for early registration dates.

2 Thanksgiving recess will include all courses that begin on Wednesday at 5:00 pm or thereafter.

## Winter Term 2020

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Registration Begins</td>
<td>Wednesday, November 4</td>
</tr>
<tr>
<td>Classes begin</td>
<td>Monday, January 6</td>
</tr>
<tr>
<td>Martin Luther King, Jr. Birthday No Regular Classes</td>
<td>Monday, January 20</td>
</tr>
<tr>
<td>Spring recess begins</td>
<td>Saturday, February 29</td>
</tr>
<tr>
<td>Classes resume</td>
<td>Monday, March 9</td>
</tr>
<tr>
<td>University Honors Convocation</td>
<td>Sunday, March 14</td>
</tr>
<tr>
<td>Dearborn Honors Convocation</td>
<td>Tuesday, March 24</td>
</tr>
<tr>
<td>Classes end</td>
<td>Friday, April 17</td>
</tr>
<tr>
<td>Study days</td>
<td>Saturday, April 18</td>
</tr>
<tr>
<td>Examinations</td>
<td>Monday-Friday, April 20-24</td>
</tr>
<tr>
<td>Commencement</td>
<td>Sunday, April 26</td>
</tr>
</tbody>
</table>

1 Check umdearborn.edu/registration for early registration dates.

## Summer Term 2020

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Registration Begins</td>
<td>Monday, March 30</td>
</tr>
<tr>
<td>Classes begin</td>
<td>Monday, May 4</td>
</tr>
<tr>
<td>Memorial Day (Holiday)</td>
<td>Monday, May 25</td>
</tr>
<tr>
<td>Classes end (Session I)</td>
<td>Monday, June 19</td>
</tr>
<tr>
<td>Study Day</td>
<td>Saturday, June 20</td>
</tr>
<tr>
<td>Examinations</td>
<td>Monday-Wednesday, June 22-24</td>
</tr>
<tr>
<td>Session II classes begin</td>
<td>Wednesday, June 29</td>
</tr>
<tr>
<td>Independence Day (celebrated)</td>
<td>Friday, July 3</td>
</tr>
<tr>
<td>Classes end (Full Term and Session II)</td>
<td>Friday, August 14</td>
</tr>
</tbody>
</table>

Dates are subject to change at any time by the Board of regents.
THE CAMPUS

The UM-Dearborn campus was established in 1956 through a gift from the Ford Motor Company. The gift included approximately 196 acres of land, the Henry Ford Estate, and funds for the construction of four buildings totaling 226,770 gross square feet. The campus has grown considerably over the past 57 years and now includes the following facilities:

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration Building</td>
<td>Offices</td>
</tr>
<tr>
<td>Academic Support Center</td>
<td></td>
</tr>
<tr>
<td>Campus Support Services</td>
<td>Offices, support services</td>
</tr>
<tr>
<td>College of Arts, Science &amp; Letters</td>
<td>Offices, classrooms</td>
</tr>
<tr>
<td>Computer &amp; Information Science</td>
<td>Offices, classrooms</td>
</tr>
<tr>
<td>Engineering Laboratory Building</td>
<td>Offices, classrooms and Labs</td>
</tr>
<tr>
<td>Environmental Interpretive Center</td>
<td></td>
</tr>
<tr>
<td>Fairlane Center North and South</td>
<td>Offices, classrooms and food service</td>
</tr>
<tr>
<td>Fair Lane Cottages</td>
<td></td>
</tr>
<tr>
<td>Fair Lane Greenhouse</td>
<td></td>
</tr>
<tr>
<td>Fair Lane Pony Barn</td>
<td></td>
</tr>
<tr>
<td>Fair Lane Powerhouse / Visitor’s Center</td>
<td></td>
</tr>
<tr>
<td>Fieldhouse/Ice Arena / Wellness Center</td>
<td>Ice rink, recreation</td>
</tr>
<tr>
<td>Gabriel Richard Center</td>
<td></td>
</tr>
<tr>
<td>Grounds Building</td>
<td>Vehicle storage, offices</td>
</tr>
<tr>
<td>Heinz Prechter Engineering Complex</td>
<td>Offices, Labs</td>
</tr>
<tr>
<td>Henry Ford Estate</td>
<td>National historic landmark</td>
</tr>
<tr>
<td>Institute for Advanced Vehicle Systems</td>
<td>Offices, Labs</td>
</tr>
<tr>
<td>Manufacturing Systems Engineering Laboratory</td>
<td>Labs, offices</td>
</tr>
<tr>
<td>Mardigian Library</td>
<td>Library, offices, classrooms, Alfred Berkowitz Gallery</td>
</tr>
<tr>
<td>Monteith Parking Structure</td>
<td>Parking, storage</td>
</tr>
<tr>
<td>Professional Education Center</td>
<td>Offices, classrooms and computer Labs</td>
</tr>
<tr>
<td>Recreational &amp; Organization Center</td>
<td></td>
</tr>
<tr>
<td>Science Building / Computer Wing</td>
<td>Classrooms, Labs, offices</td>
</tr>
<tr>
<td>Science Learning and Research Center</td>
<td>Classrooms, Labs, offices</td>
</tr>
<tr>
<td>Social Sciences Building</td>
<td>Classrooms, Labs, offices</td>
</tr>
<tr>
<td>University Center</td>
<td>Offices food service, copy center, bookstore</td>
</tr>
</tbody>
</table>

The Mardigian Library offers a student-centered environment that fosters learning by providing access to authoritative sources of knowledge and information and by helping students learn critical information literacy skills and concepts. It gives faculty and students access to sources and knowledge via modern information technology, and our librarians teach students how to find their way in the ever-expanding universe of information and knowledge. The four-story Mardigian Library houses a 340,000-volume collection and provides web-based access to a multitude of research resources, including an online journal collection of 18,000 titles, 200 online research databases and over 9,000 online books and approximately 1,200 student study stations. The facility also contains computer, audiovisual, and education laboratories, and a television studio. Librarians are accessible, either online or in person, to help students with their research needs.

The Alfred Berkowitz Gallery, located on the third floor of the Library, features changing exhibitions throughout the academic year. The gallery functions as a program laboratory, extending and supplementing other University programs, and as a showcase for exhibitions with broad public appeal.

Spaces for recreational, intramural, and varsity athletics, as well as health and physical education classes, are provided in the Fieldhouse/Ice Arena and attached Wellness Center.

The Administration Building, the University Center, and the Campus Support Services building currently house support services for the campus.

The Professional Education Center houses professional and continuing education programs.
CAMPUS SERVICES

UM-Dearborn provides a wide range of campus services for students, faculty, and staff. The various campus services provide assistance in support of the university mission and the campus community. The services include:

- Bookstore (p. 1046)
- Campus Media Services (p. 1047)
- Center for Social Justice and Inclusion (p. 1047)
- Counseling and Psychological Services (p. 1047)
- Disability Services (p. 1047)
- Information Technology Services (p. 1047)
- Institutional Equity (p. 1048)
- International Affairs (p. 1048)
- Mardigian Library (p. 1049)
- Office of Student Life (p. 1049)
- Office of TRIO Programs (p. 1050)
- Ombuds Services (p. 1050)
- On-Campus Dining (p. 1050)
- Parking (p. 1050)
- Public Safety (p. 1050)
- START: Student Advising and Resource Team (p. 1051)
- Student Conduct and Conflict Resolution (p. 1051)
- Talent Gateway (p. 1051)
- Transportation (p. 1051)

Athletics and Recreation

Vision Statement

The University of Michigan-Dearborn Department of Athletics & Recreation strives to produce a campus community, where performance in the classroom and on the fields of competition are reflections of the mission and values of the University, while creating a first-class experience for all UM-Dearborn student athletes.

Core Values

Excellence: Be committed to set the bar high, within the department, in the classroom and on the fields of play. Become masters of “attention to detail”, as we achieve our goals.

Leadership: Be a role-model for the “Leaders and Best” in academic, athletic, and social environments. Emulate, every day, the values of teamwork.

Sportsmanship: Demonstrate the combination of respect and integrity as we embody the Champions of Character program as defined by the National Association of Intercollegiate Athletics (N.A.I.A.).

 Tradition: Embrace being a Wolverine and all that encompasses, while continuing to enhance the cultures of community service and community outreach.

Varsity Sports

UM-Dearborn Athletics, a member of the NAIA and Wolverine-Hoosier Athletic Conference, participates in 10 varsity sports including men’s and women’s basketball, men’s and women’s cross country, men’s and women’s soccer, men’s lacrosse, baseball, softball and volleyball. Home events are played in the Fieldhouse and at various outdoor fields near campus. For more information on all UM-Dearborn varsity sports, go to the official Wolverine athletics website at athletics.umdearborn.edu.

Club Sports

UM-Dearborn offers a competitive opportunity at the club level in various sports. Club sports report to the department, but are responsible for their own team organization, as well as conference and national affiliations. A list of current club sports include nationally ranked men’s ice hockey, cheer, men’s and women’s wrestling, and men’s and women’s tennis.

Intramural Sports

Within the Department of Athletics & Recreation, Intramural Sports are offered for all UM-Dearborn students and staff. Currently intramural sport offerings include broomball, basketball, volleyball, soccer and flag football. All intramural sports are played on campus. For more information on UM-Dearborn Intramural Sports, contact Intramural Sports Coordinator Jordan Sweeney at jsweeney@umich.edu.

Wellness Center/Fieldhouse/Ice Arena

The Wellness Center is equipped with a variety of cardio machines, weight lifting equipment, and racquetball courts. Instructional classes are offered each semester; a schedule is posted each semester in the Wellness Center. All fitness classes cost $50 for students, members, and non-members. The Fieldhouse is host to eight volleyball courts or three full-size basketball courts, and home to our men’s and women’s basketball teams as well as the volleyball team. The weekly schedule for open gym is available at the Fieldhouse. The Ice Arena is home to our Men’s D1 ACHA men’s ice hockey team and also holds daily open skates and hockey for the campus community.

Football Ticket Distribution Policy

Season tickets to the University of Michigan-Ann Arbor football games are sold by the Ticket Office of the Ann Arbor campus Department of Athletics. UM-Dearborn students are handled by the Ticket Office on the Ann Arbor campus.

A student ticket information flyer outlining procedures to purchase tickets is mailed in March to students enrolled during winter term. The deadline for purchase is mid-April. For more information, contact the ticket office at 734-764-0247.

Bookstore

Located in the University Center, the Barnes and Noble Bookstore has a complete line of textbooks for purchase (new and used,) rental, and digital download. They can further save students money with their Price Match program. The friendly bookstore staff is ready to help and will make your textbook purchase easy to understand and easier to afford. They also carry a full line of school supplies.

Looking to show your school spirit? The Bookstore carries a wonderful assortment of UM and UM-Dearborn fashions and giftware, much of which they design themselves, and which is not available anywhere else! Stop by or check our website to see our constantly changing assortment of apparel and gifts.

Need to recharge? We also carry a great range of snacks and meal solutions, sodas and juices and energy drinks and—we’re told—the best solutions, sodas and juices and energy drinks and—we’re told—the best
coffee on campus! From soups to nuts, we are a popular spot to fill up and keep you happy throughout your day.

American Express, Discover, Mastercard and Visa are all accepted. Normal Bookstore hours are 8:00 a.m. to 6:00 p.m. Monday through Thursday. Normal Bookstore hours are 8:00 a.m. to 3:00 p.m. on Friday.

Note: Special hours are in effect at the start of each semester and during term breaks and holiday periods.

For additional information, telephone 313-593-5551 or visit the website at umd.bncollege.com (http://www.umd.bncollege.com).

Campus Media Services

Campus Media Services (CMS) supports instruction, research, and campus events by providing facilities and expertise in multimedia. These services include studio and remote video and/or audio production, video streaming, and video editing. Costs vary depending on the nature of the production.

All service requests should be made at least 2 weeks in advance.

Please call 313-593-5150 or contact Greg Taylor (gtaylor@umich.edu) for more details.

Center for Social Justice and Inclusion

2170 & 2174 University Center
313-593-6445
Email: SocialJusticeInclusion@umich.edu

The Center for Social Justice and Inclusion provides programming and support in the following areas to foster an inclusive campus:

- LGBTQ+ at Dearborn
- Multicultural at Dearborn
- Veterans at Dearborn
- Women at Dearborn
- Interfaith work

Counseling and Psychological Services

2157 University Center
313-593-5430
Email: umdearborncaps@umich.edu

Counseling and Psychological Services (CAPS) is a trusted, visible, wide ranging university counseling center that continually strives to enhance the mental health and overall wellbeing of UM-Dearborn students and the greater campus community. The Mission of CAPS is to advance student success by promoting emotional wellness and psychological development by providing culturally competent, high quality, and confidential mental health services, prevention and educational programming, campus wide consultation, crisis response, and outreach. CAPS staff and trainees are committed to providing a safe, welcoming and affirming environment for all students.

CAPS offers:

- Individual Counseling
- Group Therapy
- Workshops
- Peer mentoring groups
- Programs that support overall wellness

Disability Services

2157 University Center
313-593-5430
Email: disabilityservices@umich.edu

The Mission of Disability Services is to ensure that students with disabilities have equal access to all university programs and activities. We provide students the opportunity to reach their full potential by coordinating academic accommodations and support services. The Disability office works collaboratively with students, faculty and staff to build and maintain partnerships allowing for an inclusive educational environment. We serve as a valuable resource for the University of Michigan-Dearborn campus community in supporting the success of students with disabilities; cultivating opportunities for students to articulate their strengths; and responding to student needs and learning environments.

Information Technology Services

General Purpose Open Computer Labs: ML 1070, 1st and 2nd floor public computers, SSB 2220

Department Specific Open Computer Labs: CECS - HPEC 1180 & 183, ELB, COB - FCN 138, CEHHS - FCS 190

Lab Hours: Visit umdearborn.edu/its_location-hours (http://umdearborn.edu/its_location-hours/)

Service Desk: 313-593-HELP (4357) | umd-helpdesk@umich.edu | website: umdearborn.edu/its/helpdesk (http://umdearborn.edu/its/helpdesk/)
Walk-in locations: ML 1070b and FCS 186a

Information Technology Services (ITS) supports the computing needs of faculty, staff and students. The department has responsibility for: campus network, including Internet access; computer labs and printing across campus; account access for email, computer access, and other student services; HelpDesk support; the Banner student information system.

Facilities

Computer labs across campus are supported and maintained by ITS. General purpose open labs are located in the Mardigian Library (ML), other departmental computer labs specialize in department specific software programs to support classwork needs. Together there are over 300 open seats available for students to use for school work. Availability is posted in real-time and can be viewed by visiting labs.umdearborn.edu (https://labs.umdearborn.edu/).

Software

ITS offers a wide variety of software in the labs it supports including Visual Studio, SPSS, GIS, Minitab, Matlab, and Mathematica. Individual labs may also provide instructional software required for classes. In addition to the standard software products, all lab and classroom
computers also have Jaws, ZoomText, and Read & Write Gold installed to assist with accessibility needs.

In addition, the University of Michigan has established a licensing agreement with Microsoft that allows campus members to download Office 365 for free. Additional software and hardware can be purchased at significant discounts by faculty, staff, and students by contacting the Computer showcase. This includes Microsoft Windows, Adobe products, SPSS, Mathematica, Apple & HP hardware, and many other offerings. Visit their website for more information: computershowcase.umich.edu (http://computershowcase.umich.edu/).

Computer Accounts
The ITS Accounts Office assigns user accounts and passwords for all university network systems. They process requests for several types of computer access, and assist with questions and problems with these types of logins. These include uniqnames and UMICH passwords which permit access to wireless, email, classroom and lab computers, Canvas, and your home directory.

UPrint Student Printing
UPrint is a networked printing service for students in all UM-Dearborn schools and colleges. Registered students are allocated a 500 page quota free each term (Winter, Fall, Spring/Summer). $25 is credited on the U-Print system and each time you print from a lab or library computer, your account will be debited $.05 for black/white or $.30 for color pages. Additional funds can be added quickly online (https://uprint.umd.umich.edu/app/) with a credit card or you can add funds at the Cashier's Office.

Assistance and Services
The ITS Service Desk is the primary point of contact for support. Please call 313-593-HELP (4357) or email the HelpDesk umd-helpdesk@umich.edu for assistance, documentation and information regarding the campus network, software, printing, hardware and other services. Many questions can be answered immediately on the phone. An automated ticket system is also used to keep track of each request that is received and the service that is provided. Computer labs in ML 1070, HPEC 1180, ELB 183, & FCN 138 are staffed with student assistants who can provide answers to most questions or refer you to someone who can. Equipment problems and malfunctions in the labs should be immediately reported to the lab proctor on duty so that the amount of downtime experienced is minimized.

Hours
The Service Desk is available M-Th 8am-8pm, & 8am-5pm F during regular class schedules, during class breaks hours are M-F 8am-5pm. The Service Desk and computer labs will be closed for holidays or due inclement weather.

Institutional Equity
The Office of Institutional Equity (OIE) is committed to diversity, inclusion and equal access, which is essential to fulfilling the University's mission and vision. OIE is committed to building an inclusive and diverse University campus community. All students, faculty, and staff members whether their race, gender, age, ethnicity, cultural heritage or nationality; religious or political beliefs; sexual orientation or gender identity; or socio-economic, veteran or ability status have the right to inclusion, respect, and voice on the Dearborn campus community. Members of the University of Michigan-Dearborn campus community have a collegial responsibility to support these values. OIE promotes and supports compliance with Title IX, University policies, affirmative action, equal opportunity and equal access, and provides support to students, faculty, staff, vendors and guests.

Office of Institutional Equity
1020 Administration Building

Service Areas: Diversity, Equity & Inclusion - ADA - Title VII & Title IX
Office: (313) 593-5666
Fax: (313) 593-3568
Email: HumanResourcesDearborn@umich.edu
Web: https://umdearborn.edu/faculty-staff/human-resources/institutional-equity (https://umdearborn.edu/faculty-staff/human-resources/institutional-equity/)

International Affairs
Office of International Affairs
780 Town Center Drive
Dearborn MI 48126
Telephone: 313-583-6600
Fax: 313-583-6725
Email: umdoia-international@umich.edu
Web-address: umdearborn.edu/internationaloffice (http://www.umdearborn.edu/internationaloffice/)

Services
The Office of International Affairs welcomes and commits to provide support services to international and domestic student, faculty and visiting scholars at the University of Michigan-Dearborn. Our campus community is dedicated to providing quality services addressing the following:

• Form DS-2019 and/or I-20
• Admission Process
• Students Success Assistance
• Faculty Exchange
• Employment
• Community Engagement
• English Language Program
• Overseas Traveling
• Health Insurance – all F1/J1 students are required to have health insurance that meets UM-D standards
• Housing Referrals
• Homeland Security Compliance Advising
• Cross-cultural programs and workshops
• Emergency Assistance

Potential students are afforded assistance to ensure a seamless admissions process. Assistance begins once prospective students express an interest in the university and continues throughout their academic tenure. The OIA provides information to international students scholars about maintaining F-1 and J-1 status. They are encouraged to explore and integrate within the local and metropolitan communities while being challenged with the rigor of the university’s academic process. The students Success Center offers diverse academic, personal
and professional support through blended services that are designed to complement and support the educational track.

As we prepare our students to achieve the “Degree That Makes the Difference,” we encourage and support our students to participate in study abroad, global civic engagement projects and overseas internship employments. These opportunities help provide practical applications to what our students are learning within their academic programs. UM-Dearborn offers faculty led study abroad opportunities and assistance to students that participate in non-UM-Dearborn programs.

OIA works with the academic units to explore and support faculty exchange opportunities. Currently, the University of Michigan-Dearborn works with colleges and universities in over ten countries where faculty, students and resources are shared and rich friendships are discovered. The University of Michigan-Dearborn welcomes worldwide intellectual dialogue and exchanges that provide our students with a diverse global perspective and that challenges and prepares them for the Twenty-first Century and beyond.

Mardigian Library

According to its vision statement, the Mardigian Library is "an essential part of the University of Michigan-Dearborn experience — a campus hub for academic success, creativity, knowledge creation, and interdisciplinary collaboration; a gathering place for learners; and a catalyst for integrated learning and community engagement."

Our Collection
In support of student and faculty research, the library provides access to a multitude of print and online resources:

- 500,000 e-books
- 80,000 e-journals
- 720 databases
- 400 print journals
- 200,000 print books

Materials not available through the library’s collection may be requested from other libraries through the interlibrary loan and MelCat borrowing services.

Study Space

A variety of study spaces are available throughout the library ranging from private study carrels to a learning commons on the 2nd floor that features a variety of seating and furniture options as well as movable whiteboards. In addition, students can reserve one of two soundproof group study rooms on the 2nd floor for collaborative activities.

Research Assistance

Subject specialist librarians are available to meet with undergraduate and graduate students both in the library and in the colleges. Consultations cover developing a research topic, and finding, evaluating, using, and citing sources. Librarians also work with faculty to create research skills instruction and customized online subject guides that teach students the information skills they need. Faculty and students involved in graduate research are encouraged to contact the Graduate Research Center for help with areas such as writing dissertations and theses, copyright and plagiarism issues, and scholarly publishing.

Other Services

The User Services Desk on the 1st floor is a one-stop shop for a variety of services such as the following:

- **Hold Request Service** – Pick up library materials that you have requested through the online catalog.
- **Course Reserves** – Use course reserve materials selected by your instructor.
- **Loanable Technology** – Chromebooks, digicams, phone chargers, power strips, and cables are available for check out.
- **Basic Research Assistance** – Referrals are made to subject librarians for in-depth research needs.
- **3-D Printer** – The Mardigian Library’s IDEA Studio has a 3-D printer for use by current UM-Dearborn students, faculty, and staff.

Other Collections

The library houses other interesting and valuable collections:

- **Alfred Berkowitz Gallery** – Rotating art exhibits, speakers, and other art-related special events
- **Voice/Vision Archive** – Approximately 300 interviews with survivors of the Jewish Holocaust
- **Archives** – Historical records generated by the university such as student publications and items from the administrative offices
- **Juvenile Historic Collection** – The 11,000 juvenile book collection includes fiction, poetry, fairy tales, history, science, and biography. Publication dates range from the late 1700s through the 1970s.

Refreshments

- **Picasso’s Mug Life** – Beverages, sandwiches, and snacks are available for purchase.
- **Vending machines** – Additional beverages and snacks

Contact Us:

From the library’s home page (http://library.umd.umich.edu/) use the “Email” or “Ask A Question” links, or call 313-593-5559.

Office of Student Life

2136 University Center
313-593-5390
Email: engagement@umich.edu

The Office of Student Life promotes holistic education through transformational student learning experiences. We foster an inclusive community, support student development and persistence, and prepare future leaders through diverse programming, services, and partnerships.

What we do:

- Community Engagement
- Campus Traditions
- Leadership Development
- Student Success
Office of TRIO Programs

Rm. 123, Union at Dearborn
313-593-5425
Email: perryii@umich.edu

The Office of TRIO Programs houses multiple outreach programs, that all focus on the preparation of middle and high school students for their success in post-secondary education.

Ombud's Services

2174-B University Center
313-593-5440
Email: Ombuds-office@umich.edu

Ombuds Services provides students of the campus community with individual, informal assistance in resolving concerns and addressing issues regarding students’ rights and responsibilities.

Ombuds Services is an independent, impartial, informal, and confidential resource for obtaining:

- Information about university policies;
- Guidance in following university procedures;
- Assistance in resolving concerns and critical situations;
- Help in cutting red tape and in obtaining appropriate and timely answers and information;
- Opportunities to discuss or question university actions;
- Active support for UM-D’s commitment to ensure that students are treated with fundamental fairness and personal dignity.

*Confidentiality cannot be promised if there is serious risk of imminent harm or if required by law.

On-Campus Dining

With many fantastic options to choose from, UM-Dearborn Dining by Picasso Group has got you covered. Whether it’s your morning coffee before class, a between-classes lunch, or an evening bite, McKinley Café in the University Center, Picasso Café in Fairlane Center, and Mug Life coffee shop in Mardigian Library offer a wide variety of meals, snacks and beverages to meet your needs.

We offer special purchasing options to make check-out a breeze:

- You may purchase a Meal Card or App at McKinley Café to use at all retail food locations on campus. Funds may be added to the App remotely at your convenience.
- Purchase a Picasso Restaurant Group (PRG) Meal Plan. The Meal Plan is designed to ensure that your money is well spent by offering tasty combo meals that will fit almost any budget. Ask our culinary team for details.

University Center, McKinley Café

McKinley Café is the heart of culinary service on main campus. Picasso Deli, the Grille (serving breakfast, lunch and dinner), the Expo (daily full-meal specials), piping hot pizza, famous mac & cheese, delicious soups, salad bar, grab & go items, assorted beverages, and Starbucks.

Fairlane Center, Picasso Café

The Picasso Café, located in the hub of College of Business of College of Education, Health and Human Services action, features deli sandwich selections, personal pizzas, quesadillas, delicious soups, salads, fruit cups, vegetable cups, grab & go items, assorted beverages and Starbucks.

Mardigian Library, Mug Life Café

A cozy, artistic atmosphere awaits you in this convenient coffee shop. Drop in to fortify yourself during day or evening study time. Meet up with your friends and enjoy sandwiches, soups, snacks, Starbucks and Jamba Juice Smoothies.

Vending

Conveniently located throughout our campus facilities:

- State-of-the-art soda and snack machines
- All machines equipped with credit card readers
- Wide product variety for students, staff & faculty
- Touchscreen/video monitors on machines-displays nutritional and other information
- Commitment to M-Healthy offerings.

Parking

Parking of all motor vehicles at UM-Dearborn is by permit only. Parking for students, faculty and staff is allowed in designated permit lots only when vehicles are properly registered and display the appropriate parking decal. Student permits are available at the Parking Office in the Campus Support Service Building.

Parking is also available in the Monteith Parking Structure. The Monteith Parking Structure provides parking for all visitors on the 3rd floor. Visitors can also park in portions of E-5 and Lot F. Visitors should stop at the kiosk / pay station and the cost is $0.50 per hour. For further information, refer to the UM-Dearborn Parking & Transportation Manual or the Parking Office by telephone at 313-593-5480.

Parking Enforcement

Parking enforcement, including issuance of tickets, is primarily handled by the University of Michigan – Dearborn Police Department. There is an $80.00 fine for unauthorized parking in Faculty/Staff lots and in fire lanes, and a $175.00 fine for unauthorized parking in handicap zones. All fines are paid to the 19th District Court in the City of Dearborn.

Although the University of Michigan – Dearborn Police Department and Environmental Health Office provides 24-hour surveillance of all parking lots, UM-Dearborn cannot be held responsible for acts of theft or vandalism committed upon vehicles parking in campus lots or in the parking structure.

Public Safety

The Department of Public Safety, located in the Campus Support Services building, provides 24-hour emergency, safety and security services. Services offered include: crime prevention, emergency assistance, health/safety/crime reporting, escort service, patrol of buildings, grounds and
Within the Talent Gateway’s virtual community, you can:

- become part of a community
- engage with mentors, network, and make connections
- develop creative problem-solving skills through “challenges”
- reflect on the connections among personal, academic and career goals to get “career-ready”

All of these encourage personal growth and professional development as you develop self-motivation, agility, resiliency and flexibility. Because the Talent Gateway is web-based, you choose when and how to participate.

The (M)Talent distinction identifies students who have demonstrated the characteristics of an exceptional employee who demonstrates far more than technical skills and work experience. As students reflect on a series of “challenges,” they earn points that iteratively and gamefully help them develop life-long habits and launch them on a trajectory of continuous reflection and thoughtful action.

(M)Talent distinction

Students who achieve the (M)Talent distinction have demonstrated their initiative and drive, grown their confidence, developed creative problem-solving skills, and deepened their empathy toward others.

To earn this distinction, students must achieve 50,000 points in Talent Gateway Challenges, and complete three impact challenges. The final challenge is a presentation to demonstrate the skills developed, creative thinking and problem-solving ability, how self-reflection has been beneficial in these areas, and how other students can learn from your experience.

By completing Talent Gateway challenges to earn 50,000 points, students demonstrate the ongoing development of their professional skills and their comprehension of how their academic, personal, and career goals can be integrated. Through this program, students have developed a habit of reflection and creating thinking, thus better preparing them for the changing workforce. By presenting at the (M)Talent Showcase (the final challenge), students gain public speaking experience and confidence.

Get in the driver’s seat and join the Talent Gateway! Visit umdearborn.edu/talentgateway Location: 285 Fairlane Center North.

Transportation

Access to the campus is available on bus routes operated by Suburban Mobility Authority for Regional Transportation (SMART). Connecting service is available on routes operated by the Detroit Department of Transportation (DDOT). Additional information may be obtained by telephoning 313-833-7973.

Direct service is available from most Detroit and western Wayne County residents, with transfer service available for Oakland and Macomb County commuters. Additional information may be obtained by telephoning SMART at 313-962-5515.

UM-Dearborn provides a shuttle service between the main campus and Fairland Center for students, staff, and faculty. A valid ID card is required to board the shuttle. The shuttle will pick up and drop off passengers at the University Center turnaround, the Fairlane Center South turnaround, the Administration Building turnaround, and the Union. UM-Dearborn also provides an International Shuttle that runs between the Fairlane Meadows apartment complex, Fairlane Woods apartment complex, Fairlane Center, and the University Center. For times of operation, consult the Parking website: umdearborn.edu/parking-and-
transportation (https://umdearborn.edu/about/visit-campus/parking-and-transportation/).
CAPSULE HISTORY OF THE UNIVERSITY OF MICHIGAN-DEARBORN

The origins of the University of Michigan-Dearborn can be traced to manpower supply studies conducted by Archie Pearson, director of training for Ford Motor Company, in the mid-1950's. Convinced that serious shortages were looming for the Company in qualified, college-trained engineers and junior administrators, he made discreet inquiries of educational institutions in the Detroit area concerning their willingness to adjust their programs to meet these needs.

Pearson was particularly interested in a program with a cooperative education component that would provide several periods of full-time work experience, alternating with regular terms of professional academic study. However, until Pearson and his associates were put in touch with members of the top administration at the University of Michigan, the search had been futile. In late 1955, Pearson, with his associates, began negotiations with the University of Michigan officials that led to the establishment of the Dearborn Center of the University of Michigan.

The announcement on December 17, 1956 of a gift of land and capital development money from the Company to the University emphasized the building of an upper-division and master's level campus which would adopt a cooperative work-study requirement as a part of its regular degree program in engineering and business administration. The University was to provide the regular professional and liberal arts courses necessary to a University of Michigan bachelor's or master's degree, with the co-op work assignments forming an integral addition to the regular academic requirements. UM-Dearborn opened as the Dearborn Center of the University of Michigan on September 28, 1959.

The upper-division cooperative education program was the first important educational emphasis of what is now UM-Dearborn. Cooperative education is still a vital part of the professional programs, and not only has it expanded to include liberal arts students, but other kinds of off-campus experience for credit have been added as well. There are now regular program-related internships in political science, economics, social work, humanities, health studies and public administration. Nevertheless, it became apparent in the early days that the campus could not afford to be limited to a single focus, and over the years the University has gone through several stages of modifying its original purposes and structure.

From its inception in 1956 to about 1962, the cooperative education program was confidently set forth as a sufficient raison d'être for the campus, in spite of growing evidence that this admittedly fine and educationally sound opportunity was not drawing a sufficient number of students for economical use of the facilities. In the fall of 1962, William Storit, the University of Michigan Vice President and UM-Dearborn's first chief executive, extended cooperative education to the liberal arts areas on an optional basis. Few liberal arts co-op work assignments were actually made before 1973, when the present liberal arts co-op program was officially established. This early attempt to extend the co-op program to liberal arts constituted the last major attempt to build the campus solely on the basis of the co-op programs and the upper-division/graduate structure. That effort came at about the same time as the change in the name of the institution from "Center" to "Campus" (to make its objectives seem less limited). Both events marked the beginning of a period in the mid-1960's characterized by growing uncertainty about the future of the institution. This period ended in 1969 with the recommendations of the Ross Committee (also referred to as the Balzhiser Committee, and officially called the Dearborn Campus Planning Study Committee), which radically changed the direction of the campus.

The 1969 report of the Dearborn Campus Planning Study Committee, appointed by University Vice President for State Relations and Planning Arthur Ross to consider the future of the campus, recommended the addition of the first two years of undergraduate education for the Dearborn Campus to become a full four-year institution along with expanding non-co-op programs. Those and other changes were implemented in 1971 giving the campus its present structure along with the newly designated title of "The University of Michigan-Dearborn" and a Chancellor as its chief executive officer. Two years later, the organizational structures changed from "divisions" to schools and colleges, and the Division of Education ("Urban Education" for the first few years) was created, with each of the major academic units headed by a dean. The Board of Regents appointed the first Chancellor of the UM-Dearborn, Dr. Leonard E. Goodall, in July 1971.

After that watershed change in 1971, UM-Dearborn grew rapidly from just under 1,000 students to over 6,000 in 1979. From 1971 through 1979 there was a scramble just to supply the courses and facilities needed to accommodate the soaring student population propelled by the transition into a University. New faculties were added at the rate of 10 to 20 per year, and the face of the campus changed as a new set of buildings (the former University Mall now remodeled as the University Center, the Fieldhouse, and the Library) was planned and constructed to the south of the original four buildings. These years of expansion also ushered in a period of severe retrenchment, when the debt burden of the new structures coincided with a recession and cuts in state aid to the campus. Dr. William Jenkins, appointed as UM-Dearborn's second Chancellor in 1980, took the helm at the beginning of what may be called the institution's "Years of Consolidation."

The early 1980's at UM-Dearborn were, as in the state of Michigan as a whole, a period of severe financial crisis. From 1979 through 1982, over a million dollars of funds allocated to UM-Dearborn by the state had to be recalled. During that same time, faculty and staff salaries were cut and student tuition rose 44 percent in three years. Nevertheless, student enrollment, after a slight drop from 1982 to 1984, resumed its steady rise that has continued to the present. Facilities were constructed also, including Manufacturing Systems Engineering Laboratory, the Social Sciences Building (formerly the School of Management Building), and the Computing Wing of the Science Building.

From about the time of the inauguration of Chancellor Blenda Wilson (1988), several developments in campus organization, administrative personnel, and academic offerings have highlighted what might be called the "Years of Redirection". At the center of this "redirection" has been a program of strategic planning, initiated in the summer of 1990 and reinforced by planning retreats for the whole campus in the fall terms of 1990, 1991 and 1992. A new campus mission statement arose out of the first retreat which rearticulates UM-Dearborn's commitment to providing an experience of academic excellence for a diverse body of students from the metropolitan Detroit area, encouraging full community attention to the traditions of free intellectual inquiry, critical thinking and ethical behavior through interactive teaching, research, creative and applied scholarship, and service. From the second retreat emerged the principal points of a set of learning goals for undergraduate students.

In 1993, the Board of Regents appointed Dr. James C. Renick as the fourth chancellor of UM-Dearborn. Under Chancellor Renick, UM-Dearborn experienced several important developments: (1) a new Mission
Statement was formulated; (2) a new set of Campus Bylaws provided for a newly formed Faculty Senate; and (3) funds were received from the State for the construction of four major new facilities for the School of Engineering, the College of Business, the Center for Corporate and Professional Development, and the College of Arts, Sciences, and Letters.

In July of 2000, the Board of Regents appointed Daniel Little as UM-Dearborn's fifth Chancellor. Under Chancellor Little's leadership the campus has achieved record enrollment growth, increased the academic quality of the student body, and improved the academic support system for student success. During these years the campus came to embrace a metropolitan vision that encourages engagement with the community by students, faculty, and staff. Particular areas of metropolitan focus include supporting advanced manufacturing, contributing to racial and ethnic equality, enhancing P-K12 education, addressing urban environmental issues, and contributing to progress in health care and health equity. Little has helped to build strong relationships between UM-Dearborn and a wide range of community-based organizations to enhance the impact and partnership of the university in the Detroit metropolitan region. The Chancellor also led the campus in establishing a public-private partnership to offer a student-housing option for the first time on campus since the 1980s.

In 2009, UM-Dearborn welcomed its fourth Provost and Vice Chancellor for Academic Affairs, Dr. Catherine A. Davy. Under her leadership, the School of Education was transformed into the College of Education, Health, and Human Services with a focus on health studies. In addition, a new campus-wide general education program titled the Dearborn Discovery Core was developed. Finally, in the fall 2014, Provost Davy led the successful reaccreditation of UM-Dearborn by the Higher Learning Commission.

Source of information up to 1984: A Gift Renewed, written by Professor Elton D. Higgs.
The Academic Code of Conduct (ACC) for the University of Michigan-Dearborn is based on the premise that undergraduate and graduate students will perform honestly and ethically on all tests, projects, and assignments. Students are expected to conduct themselves in a manner conducive to an environment of academic integrity and of respect for the educational process. Therefore, an individual should realize that deception for the purpose of individual gain is an offense against the members of the community.

To ensure that the ACC functions properly, all UM-Dearborn faculty should include in their syllabus the following statement:

“The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University’s standards of academic conduct as set forth by the Code of Academic Conduct, as well as policies established by the schools and colleges. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses. Violations will not be tolerated and may result in penalties up to and including expulsion from the University.”

All students and faculty members are required to familiarize themselves with the ACC, its implications and effects. Unfamiliarity with the ACC could result in ineffective enforcement or the violation of student rights. It is recommended that department chairs and program directors discuss the ACC with their instructional faculty at periodic intervals.

Any violation of the ACC by undergraduate or graduate students will be dealt with in accordance with the procedures described below.

II. Prohibited Academic Conduct

The actions cited as prohibited conduct should be used as a guide rather than an exhaustive list of behaviors that the University considers misconduct and subject to disciplinary action.

1. Plagiarism: includes representing the words, ideas, or work of others as one’s own in writing or presentations, and failing to give full and proper credit to the original source. Failing to properly acknowledge and cite language from another source, including paraphrased text. Failing to properly cite any ideas, images, technical work, creative content, or other material taken from published or unpublished sources in any medium, including online material or oral presentations, and including the author’s own previous work.

2. Cheating: includes Copying from another’s exam or other evaluative assignment. Using notes, books, digital devices or resources, or other materials for an exam or other evaluative assignment without explicit permission of the instructor. Submitting work that was previously used for another class without the informed permission of the instructor. Discussing or sharing information about questions or answers on an exam or other evaluative assignment without explicit permission of the instructor. Giving, taking, or receiving a copy of an exam without explicit permission of the instructor. Allowing another person to take an exam or complete an assignment for the student. Attempting to change the result of an exam or other evaluation.

3. Fabrication: includes alterations to transcripts, grades, letters of recommendation, or other evaluations by or for any current or former student.

4. Aiding and Abetting Dishonesty: altering documents affecting academic records; aiding others to commit any act prohibited by the ACC; forging a signature of authorization or falsifying information on an official academic document, election form, grade report, letter of permission, petition, or any document designed to meet or exempt a student from an established University or unit academic regulation.

5. Interference: obstructing or hindering the work or study of a member of the faculty, or staff, or a student at the University.

III. Disciplinary Actions

Faculty members have the authority to impose penalties with respect to her or his class. These penalties include, but are not limited to, reducing a student’s course grade or failing a student in the course(s).

For first-time offender cases that are appealed, the Academic Integrity Board shall have the authority to sustain or overturn the faculty member’s determination of an ACC violation. Each college may choose to impose additional sanctions, including but not limited to the suspension of scholarships. Any additional sanction imposed by a college shall be reviewed and approved by the Provost.

For repeat offenders, the Board shall make a recommendation to the dean calling for one or more of the sanctions provided in section G of the UM-
Dearborn Student Rights and Code of Conduct (https://umdearborn.edu/about/policies-and-procedures/student-affairs-policies-and-procedures/student-rights-code-conduct/). Each college may also choose to impose additional sanctions, including but not limited to the suspension of scholarships.

IV. Reporting a Violation
When a faculty member believes a student has violated the University's ACC, s/he will communicate with the student in person in order to discuss the case in detail. The faculty member shall in person inform the student of the nature of the ACC charges; explain the sanctions imposed as a result of the charges; and provide him/her an opportunity to refute the allegations. The instructor should also inform the student of the following: 1) s/he has the right to appeal through the Academic Integrity Board within ten (10) academic calendar days of receiving the notification letter; 2) that the case will be reported to the College's associate dean designated with monitoring for repeat offenses. Under no circumstances should the faculty member share confidential information about the ACC processor case with other colleagues, except with the department chair, the associate dean, or the instructor of record.

After meeting with the student[s] potentially involved (or arranging for an alternative communication if the meeting is not feasible, such as in the case of an online class or when the student avoids does not respond to a faculty member's request for a meeting), the faculty member shall report the violation using the online reporting tool (https://umdearborn-advocate.symplicity.com/public_report/index.php/pid922171/), including supporting documents if necessary, within five (5) academic calendar days from the first faculty attempt notification. The faculty member may report a violation even if the faculty member does not have the direct authority to impose an appropriate penalty.

The associate dean responsible for ACC violations shall send an email which secures a delivery receipt to the student within three (3) academic calendar days of receiving the faculty members report with the following information: 1) confirmation that the allegation and the sanction from the instructor is a matter of record; 2) notification that the record of the incident is in a University academic integrity database and 3) explanation of the services and support provided by the Ombuds Services Office in Enrollment Management & Student Life in relation to ACC violations.

The associate dean of the charging unit shall ensure that all ACC violations received shall be entered into the University database and s/he shall conduct a search of the database for prior ACC violations by the student. If the student has a prior ACC violation – regardless of whether guilt was admitted – then a hearing of the Academic Integrity Board shall be automatically convened.

V. Academic Integrity Board Jurisdiction, Composition, and Conflict of Interest
Each college shall create its own Academic Integrity Board which shall be a permanent standing committee of the college and have jurisdiction over alleged violations of the ACC. The Board shall consist of three (3) full-time faculty members of the college serving two-year terms; three (3) non-voting students serving one-year terms; and the Ombuds Services Office director or designee as an ex-officio, non-voting, advisory member.

The faculty members shall be appointed by the college's executive committee and the Student Government President shall select the student members who shall have no record or pending accusations of academic violations. A chair of the Board – chosen from its members – shall function as the administrative head.

Members of the Board shall disqualify themselves from hearing a case if they believe their capacity for making an objective judgment in the case is or may reasonably appear to be impaired. Members should not disqualify themselves for any other reason. Replacements for disqualified members shall be selected in the manner described in paragraph one of section V.

VI. Academic Integrity Board Procedures
1. A hearing of the Academic Integrity Board shall be called by the associate dean if a student: 1) contests the accusation(s) against her/him within ten (10) academic calendar days of receiving the letter from the charging unit's associate dean, or 2) has an existing ACC violation on record. A student shall initiate an appeal through the "Appeal" link found in the Notification of Violation of Academic Integrity Policy email sent to the student by the associate dean.

2. Within fifteen (15) academic calendar days after referral, the Board shall meet to discuss the case.

3. The Board's decision/recommendation shall be based on a preponderance of the evidence standard of proof.

4. The Board shall examine and evaluate all documents within the files submitted. The Board shall examine whether the process set forth in this policy was duly followed by the faculty member. The Board has the authority, but is under no obligation, to meet with the instructor and student. Unless the Board rules to overturn the faculty member's accusation or sanction of an ACC violation. In the event that the Board overrules the faculty accusation or sanction, the Chair and the Board shall relay this information to the faculty member. The faculty member is allowed to request a meeting with the entire Board if the faculty member so desires. If the Board meets with one party they shall give the opposing side an opportunity to appear. Either party may call for the appearance of no more than three witnesses. University students, faculty, and employees are required to comply with the requests to appear as witnesses. For all other matters, the Board shall promulgate its own policies.

5. For first-time offender cases, the Board shall have the authority to sustain or overturn a faculty member's accusation and sanction of an ACC violation. Each college may choose to impose additional sanctions, including but not limited to the suspension of scholarships. Any additional sanction imposed by a college shall be reviewed and approved by the Provost.

Upon making its decision the Board's chair shall inform in writing the associate dean, or the student and faculty member. If the Board overturns a faculty member's decision then all records of the ACC violation shall be removed from the University academic integrity database.

6. For repeat offenders, the Board shall first meet and make a determination of a violation. If the student is found to have violated the ACC then the Board will reconvene to decide the proper penalty. Before the second hearing, the student and faculty member may submit evidence or a statement concerning the appropriate sanctions to be imposed.
Factors that may be considered in determining the nature of sanctions to be imposed include: 1) the intent of the student; 2) the effect of the conduct on the University community; 3) past disciplinary record of the student; and 4) any mitigating factors presented by the complainant (i.e., stress, personal illness, illness/death of family members, cultural misunderstandings, etc.). Upon reviewing the submitted materials the Provost and Vice Chancellor for Academic Affairs or designee shall meet to discuss the recommended sanction.

7. When a student presents details that would suggest that the challenged action stemmed from conduct violating a non-academic policy, such as sexual harassment and other forms of discrimination, then no further action will be taken pending the completion of the Office of Institutional Equity proceedings.

VII. Final Decision
For repeat offender cases, the dean shall make the final decision within ten (10) academic calendar days of the Board issuing its recommendation(s). The dean will decide the case on the basis of the records of the proceedings of the Academic Integrity Board, the written materials submitted by the student, and the results of his or her consultation with the parties if any.

The dean’s decision shall be written and contain the dean’s finding of fact and may (at the discretion of the author) include reasons for the decision. It shall be provided to the student, the student’s dean (if applicable), the department chair/program head, the faculty member, and the chair of the Academic Integrity Board, and placed in the student’s file.

If the student is from another unit then the charging college’s dean along with the student’s home-unit dean shall review the records and other materials together and issue a joint-decision. If the two deans cannot come to an agreement then the Provost shall make the final decision according to the procedures laid out in paragraphs one and two of section VII.

VIII. Automatic Procedural Review
The Office of the Provost for Academic Affairs shall conduct an automatic review to ensure no material procedural error in the process occurred. If the Provost Office determines there was a material procedural error then the case shall be remanded to a reconstituted Board for a new hearing.

IX. Maintenance of Records
All records related to ACC violations shall be maintained by each unit in accordance with the Family Education Rights and Privacy Act.

X. Responsible Administrator
The Provost and Vice Chancellor for Academic Affairs or designee is responsible for the annual and ad hoc review of this policy and its procedures. The Faculty Senate is responsible for the approval of this policy.

Approved by the Faculty Senate November 10, 2014
Amended by the Faculty Senate May 14, 2018
Waitlist

Waitlists will not close prior to the first day of classes. Waitlists will remain open during the first eight days of classes for a full term, and the first three days of class during a half term. During this time, students may add or drop their names to/from waitlists via UM-Dearborn Connect.

Attendance Requirement

A student is expected to attend every class and laboratory for which the student has registered. Each instructor may make known to the student their policy with respect to absences in the course. It is the student's responsibility to be aware of this policy. The instructor makes the final decision to excuse or not to excuse an absence. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester.

Audit of Courses

Students are expected to elect courses for credit. The student's academic adviser, however, with the concurrence of the instructor involved, may grant official auditing privileges when they are warranted for educational reasons. A student auditing a course is charged the usual fee for that course. Any specific conditions must be enunciated by the instructor at the time permission is granted for the audit. Please consult your college's advising office for additional guidance.

Classroom and Learning Management System Course Access Policy

Classroom Course Access

The University of Michigan-Dearborn campus has based its classroom access policy on the following statements from Chapter 8.D.5. of the University of Michigan Faculty Handbook titled, "Authorized and Unauthorized Persons in the Classroom":

"Generally, persons not enrolled or otherwise officially authorized to attend a course should not be permitted to attend classes. Authorized individuals include prospective students who are visiting a class pursuant to a school or college admissions program."

Members of the faculty have some discretion in permitting guests into their classroom or laboratory. A guest is defined as anyone who is not officially enrolled in the particular course or laboratory and has received an explicit and time-limited invitation by the course instructor. Guests include faculty, staff, non-registered students, or community members. Faculty must be mindful of student privacy concerns and the need of the campus to comply with the Family Educational Rights and Privacy Act (FERPA). Faculty can permit guests to attend up to two weeks of classes before submitting a one-time petition to their department chair to extend the access period for an additional two weeks of classes. Department chairs shall consider safety, resources, privacy, and fairness in their decisions. University of Michigan Dearborn students with a need to attend a course for longer than four weeks have the option to elect the course under the University auditing policy.

Learning Management System Course Access

Instructors of record and officially registered students will automatically receive access to the University of Michigan-Dearborn Learning Management System (LMS). Waitlisted students will also automatically receive LMS access, but in a view-only state. In addition to these automatic additions from the student information system, the University permits adding teaching assistants, supplemental instructors, and inviting outside and/or guest speakers to the LMS in accordance with FERPA and privacy considerations.

Whereas students with incomplete grades from a previous semester may be granted limited guest access to the physical classroom or laboratory as above under the Classroom Course Access policy (two weeks), they will be granted continued access to the LMS course materials in the closed course/section in which they were enrolled for the duration of the time in their incomplete contract. Faculty can obtain extended access to closed courses with assistance from the LMS support staff.

For courses similar to independent study and directed research, faculty shall only use the LMS generated dedicated course shells, which may not be combined with other shells.

Note that this access policy does not apply to classroom visits virtual or otherwise arranged between the instructor and the college, department, or peer evaluators for purposes such as mentoring, promotion, evaluation, instructional design, or embedded academic and technical support.

Corequisites and Prerequisites

Students are required to follow all prerequisites and comments listed in the Schedule of Classes and Undergraduate or Graduate Catalog, or the "Course Descriptions" section. Special attention should be given to courses in which a concurrent election is required (e.g., Chemistry 134). For such courses, the student must also register for the Recitation/Laboratory if different from the course reference number (CRN) for the lecture. Students will be prevented from registering for courses for which the proper corequisites and prerequisites are missing. Any exceptions to this policy requires approval from the department or college offering the course.

Disruptive Student Behavior

I. PREAMBLE

When disruptive behavior occurs in the class, the instructor shall make reasonable effort to address the disruption with the student, preferably in private. Toward that end, the instructor and student may consult with Ombuds Services, the Dean of Students, the department chair, or other University offices to discuss ways to resolve the situation informally at any time during the process set forth in this policy.

II. DEFINITION

Disruptive student behavior in the classroom (on and off campus) is likely to negatively affect the educational experience of the students and instructor(s). Disruptive behavior is defined as any speech or actions that hampers the ability of the instructor(s) to teach or students to learn. Examples of disruptive behavior include, but are not limited to:

- Creating excessive noise
- Refusal to comply with instructor direction
When threatening disruptive behavior occurs in a class:

STEP ONE: INSTRUCTOR’S RESPONSE TO DISRUPTIVE BEHAVIOR

When non-threatening disruptive behavior occurs in a class:

A. The instructor will verbally or (in the case of online or hybrid class situations) via email warn the student that their behavior is disruptive and that it must cease immediately or the student may face removal from the class.

B. If the student fails to again comply with the instructor’s warning to cease the disruptive behavior, the instructor may give a second warning and note that the next disruption will lead to the student being asked to leave the classroom or online space for the remainder of the class period.

C. If the student is asked to leave the classroom for the remainder of the period based on a third disruptive incident, but refuses, the instructor may summon the campus police to escort the student from the classroom. If online class, faculty can moderate and/or temporarily disable LMS functions to prevent the student from further activity until a resolution is determined.

D. At the conclusion of the class period the instructor should file a CARE report.

E. If at any time the instructor or student believes it would be beneficial to contact Ombuds Services, the student may consult an Ombudsperson in an effort to resolve the matter.

F. If the student's non-threatening disruptive behavior persists in subsequent course meetings instructor(s) may proceed to Step Two, below.

When threatening disruptive behavior occurs in a class:

A. If the instructor believes the disruptive behavior poses an immediate threat to the safety of the instructor, the student, or any other students or persons, the instructor should summon the campus police to report the incident and remove the student from the class if on campus, regardless of whether a warning has been issued. At the conclusion of the class period the instructor should immediately file a CARE report.

B. If the instructor believes the student should not be permitted to return to the class to continue in that course, the student should proceed to Step Two, below.

STEP TWO: WITHDRAWAL PROCESS

A. THE INSTRUCTOR

1. If the instructor believes that withdrawing the student from the course is the appropriate course of action, the instructor shall, within one (1) business day of the disruptive incident, file a report with the Dean of Students’ Office detailing the disruptive incident(s). The Dean of Students will immediately notify the faculty member’s department chair.

2. If the instructor has the disruptive student in more than one class, and the instructor believes that the student is disrupting learning in more than one of those classes, or when the student is exhibiting threatening and/or intimidating behavior outside the class (e.g., in the instructor’s office, outside the classroom, 3 etc.), the instructor may recommend that the student is removed from all courses taught by that instructor.

B. DEAN OF STUDENTS

Except for extenuating circumstances, the following steps will be followed:

1. Upon receipt of the disruptive student report from the faculty member, the Dean of Students and the faculty member’s department chair shall determine if the threshold for a formal process is required.

2. If the decision has been made to pursue a formal process, the Dean of Students shall notify the student via University of Michigan-Dearborn email within 3 business day of receiving the Instructor’s report. The email shall include:

   • Notice to the student that a formal evaluation process has begun;
   • A written description of the disruptive behavior incident and faculty complaint;
   • A link to the Disruptive Student Conduct Policy, which includes a description of the appeals process;
   • A statement letting the student know of the 5 business day deadline to respond to the complaint; and
   • Ombuds Services contact information.

3. The Dean of Students and department chair have the authority to put interim measures into place until a resolution has been reached, as needed to serve the academic mission of the University. Interim measures may include separation from the class(es) or other interventions deemed appropriate. These measures may be kept in place until the end of any review or appeal process. To the extent possible the university will provide opportunities for the student to continue working on their coursework. Failure to abide by the interim interventions is a violation of this Policy and may lead to additional disciplinary actions.
4. The Dean of Students and department chair shall make themselves available to meet with the student as soon as possible within 5 business days after notice is provided to the student.

5. Within 5 business days after meeting with the student, or if the student does not avail him/herself of the meeting option, the Dean of Students and department chair shall decide on the appropriate outcome and send notice of their decision, with an explanation of the basis for the decision, to the student, instructor, and dean via University of Michigan-Dearborn e-mail. The decision may consist of:

- Allowing the student to return to course or courses, with or without conditions;
- Allowing or requiring the student to transfer to another course section or sections; or
- Withdrawing the student from the involved course or courses.

There shall be included in the email communication a notice that the student may appeal the decision to the college dean within 5 business days from the date of the email notice of the decision.

STEP THREE: THE APPEALS PROCESS

The student may appeal the decision of the Dean of Students and department chair to the college dean. The student’s appeal must be received by the college dean within 5 business days of the date of the decision. The college dean's decision shall be made and will be sent to the student via University of Michigan-Dearborn email within five 5 business days of receipt by the college dean of the student’s appeal.

STEP FOUR: FINAL RESOLUTION

Students withdrawn for disruptive behavior from a course will receive a grade of W. If the charge of disruptive behavior is upheld, regardless of whether the student is allowed to return to the course, the student is responsible for any loss of financial aid. In the event a decision is made at any point in this process that the student was removed from class without sufficient cause, then the student will be allowed to immediately return to the course without penalty and the chair and instructor will work with the student to facilitate the completion of any work missed.

DISRUPTIVE STUDENT BEHAVIOR IN OTHER ACADEMIC SETTINGS

I. PREAMBLE

Just as each instructor should prepare their students regarding expectations for student behavior, so, too, should personnel in other academic settings. Work areas such as libraries and offices, unlike classrooms, are frequented by the public. Hence, personnel in these areas may not have as much control over who enters their space as does an instructor teaching a class. Preventive measures rely, in part, on the protocol established within offices or other university facilities. These measures can include signage, literature regarding how a student may file a complaint, training on communication techniques for staff who initially come into contact with people entering the area, and procedures for office personnel to follow should a disruption occur. These procedures should include a referral to the appropriate unit head so that a potentially disruptive student has a resource to which the student can be directed to address a concern.

II. DEFINITION

As is the case with disruptive student behavior in the classroom, disruptive student behavior in other academic settings can negatively affect the educational experience of students and instructor(s). Disruptive student behavior in other academic settings is speech or action that is disrespectful and/or threatening and either interferes with the learning activities of other students or instructor(s) or impedes the delivery of University services, including but not limited to:

- Campus and colleges offices/staff
- The library
- Learning centers
- Field trips
- Study abroad
- Study lounges and/or study rooms
- Other curricular or co-curricular units

III. PROCEDURE

STEP ONE: Response to the Disturbance

When non-threatening disruptive behavior occurs in an academic setting outside the classroom:

A. The staff or faculty member will verbally warn the student that their behavior is disruptive and that it must cease immediately or the student may face removal from the immediate setting.

B. If the student fails to again comply with the staff or faculty member's warning to cease the disruptive behavior, the staff or faculty member may give a second warning and note that the next disruption will lead to the student being asked to leave the immediate setting for the day.

C. If the student is asked to leave the immediate setting for the remainder of the day based on a third disruptive incident, but refuses, the staff or faculty member may summon the campus police to escort the student from the immediate setting.

D. At the conclusion of the disruptive event the staff or faculty member should file a CARE report (https://umich.qualtrics.com/jfe/form/SV_0AQ9ConHqso2Qjr/).

E. If at any time the staff/faculty member or student believes it would be beneficial to contact Ombuds Services, the student may consult an Ombudsperson in an effort to resolve the matter.

F. If the student's non-threatening disruptive behavior persists in subsequent interactions with the staff or faculty member proceed to Step Two, below.

When threatening disruptive behavior occurs in an academic setting outside the classroom:

If the staff or faculty member believes the disruptive behavior poses an immediate threat to the safety of the student, any other students or persons, or them, the staff member or faculty should summon campus safety to remove the student, regardless of whether a warning has been issued. At the conclusion of the disruptive incident the staff or faculty member should immediately file a CARE report (https://umich.qualtrics.com/jfe/form/SV_0AQ9ConHqso2Qjr/).
STEP TWO: DEAN OF STUDENTS REVIEW
The Dean of Students and the appropriate university personnel shall determine if the threshold for a formal process is met.

If the Dean and appropriate university personnel determine, based on the initial review of the complaint, that the alleged behavior is not actionable or that the matter would be better handled through another process or office, the Dean will notify the staff or faculty member via University of Michigan-Dearborn email that the matter is not actionable.

If the Dean of Students determines, based on an initial review, that the alleged behavior requires an additional response from the University, the Dean will notify the staff or faculty member that the issue is being addressed. The student will be notified via University of Michigan-Dearborn e-mail within 3 business days to schedule a meeting. The email shall include:

- Notice to the student that a formal evaluation process has begun;
- A written description of the disruptive behavior incident;
- A link to the Disruptive Student Conduct Policy, which includes a description of the appeals process; and
- Ombuds Services contact information.

The Dean of Students shall have the authority to put interim measures into place until a resolution has been reached, as needed, to serve the academic mission of the University. Interim measures may include separation from the setting or other interventions deemed appropriate. These measures may be kept in place until the end of any review or appeal process. Failure to abide by the interim interventions is a violation of this policy and may lead to additional disciplinary actions.

Within 5 business days after meeting with the student (or if the student does not avail him/herself of the meeting option, the Dean of Students shall decide on the appropriate outcome and send notice of the decision, with an explanation of the basis for the decision, to the student, staff/faculty member, director or unit head of the staff/faculty member, and college dean via University of Michigan-Dearborn e-mail. The decision may consist of:

- Allowing the student to return to the academic setting in which the incident occurred, with or without conditions;
- Prohibiting the student from returning to the academic setting in which the incident occurred;
- Suspending the student through the Non-Academic Code of Conduct policy; or
- Other sanctions deemed appropriate.

There shall be included in the email communication a notice that the student may appeal the decision to the Provost or designee within 5 business days from the date of the email notice of the decision.

STEP THREE: THE APPEALS PROCESS AND FINAL RESOLUTION
The student may appeal the decision of the Dean of Students to the Provost or designee. The student’s appeal must be received by the Provost or designee within 5 business days of the date of the decision. The Provost or designee decision shall be made and will be sent to the student via University of Michigan-Dearborn email within 5 business days of receipt of the student’s appeal.

1 Staff includes student employees like Supplemental Instruction Leaders, Tutors, and Learning Centers consultants as well as full time staff members.

Exceptions and Petitions
Students are responsible for complying with all policies and deadlines at the University of Michigan-Dearborn. The University academic policies, procedures, and deadlines can be found online in the Undergraduate and Graduate Catalogs along with the Academic Calendar. A petition may be used to request an exception to some academic rules and policies.

Academic petitions are not automatically granted, but rather reviewed and evaluated with consideration of fairness and equity for all students, and on the basis of strong and well-documented arguments which clearly support a student’s case for an exception. An exception to University policy is warranted only in cases involving unusual or extenuating circumstances that would normally not be faced by other students. Students should be aware that not every academic policy is petitionable. For a list of petitionable academic policies students should consult the Student Petitions webpage.

For cases unrelated to academic policies, such as disputing a grade, non-academic cases, or other equity concerns, students should seek the counsel of the University Ombuds for a referral to the correct policy or relevant office.

Procedures for Filing Petitions:
Petition requests must be submitted prior to graduating from the enrolled degree program and within three years of the petitionable event, unless otherwise specified in the policy governing the topic of the petition.

1. Complete the online Academic Policies Petition Form, found on the Student Petitions webpage, including preparing a well-supported rationale describing the request for an exception to policy.  
2. Attach all supporting/relevant documentation to the form. Some examples are hospital records, a letter from a physician, a statement from a counselor, or court records. If the circumstances relate to a death, an obituary or death certificate should be submitted. Students are encouraged to make copies for their personal files.

NOTE: When an academic action is reversed as a result of an approved petition, students may lose eligibility/benefits. There, students should consult with the appropriate offices (e.g., Financial Aid, Veterans Affairs, Athletics, etc.) to assess the potential consequences before submitting a petition. Once submitted, the petition and supporting documents become a part of a student’s educational record (link is external).

Please allow approximately four to six weeks for the petition to be reviewed. Students will be notified by email or mail of the decision.

Examples of Appropriate and Inappropriate Requests
If a student is hospitalized before the withdrawal deadline, ideally the student would withdraw before that date.

1. However, if a student is hospitalized and misses the semester withdrawal deadline, it may be appropriate for the student to file a petition requesting a retroactive withdrawal, which needs to include official documentation such as hospital records or a letter from their physician.

2. If the student was hospitalized and fully recovered before the withdrawal deadline, a petition would not be appropriate because the student would have been able to act within the deadline.
Petitions Evaluation Process
Petitions are reviewed on a regular schedule. Depending on the type of petition, the following offices are involved in the review and approval process:

1. College Advising Office  
2. Graduate Staff  
3. Faculty  
4. Graduate Program Director  
5. College Academic Standards Committee [1]  
6. Office of the Dean  
7. Office of the Provost

Financial Aid recipients and students who receive Veteran Educational benefits are advised to meet with the appropriate office to review any possible effects from the petition approval.

[1] Each unit shall have a committee serving as an academic standards committee (ASC) with a minimum of three faculty members. ASC will include an ex officio academic advisor (non-voting) who will present objectively to the committee, provide context for each case, answer questions and provide clarifications.

Final Exams and Study Days
Within the first week of the term, each University of Michigan-Dearborn instructor is expected to provide enrolled students in attendance with a syllabus specifying the major requirements and evaluation methods of the course. If a final exam is planned, it must be administered during the period of time set aside following the last day of classes for final examinations. Neither students nor faculty members may make changes in the published examination schedule without prior approval of the Registrar.

Final Assessment Policy
The vast majority of courses at the University of Michigan-Dearborn are offered during a fifteen-week academic semester. The scheduled Final Examination week is the concluding week of that academic semester and represents an important component of the courses for which our students are paying. Assessment of student learning is an important element of maintaining a high-quality education at the University of Michigan-Dearborn. To that end, the University considers the administration of a final assessment (e.g., a project, exam, assignment, or other final graded activity) to be a best practice.

It is the policy of the University to adhere to the final examination schedule as published in the Schedule of Classes each semester. This policy applies to all students.

1. Final Assessment Scheduling: Final assessment must take place during finals week and after Study Day. The week of classes preceding the scheduled final examination period must be used primarily for continued instruction in order to satisfy the number of contact hours required for the course. No final examinations are to be given during the seven days preceding the start of the finals period. No final assessment (project, test, quiz, presentation or essay) can be due during the last week of classes, rather, it is to be due during finals week, on the day assigned by the Registrar. However, lab practicums and seminar presentations may be scheduled during that week.

- A final assignment (including take-home exams or projects) given in lieu of a final exam shall be due no earlier than the first day of the final exam week.
- For online classes, the final assessment must be given a due date that falls within the final exam schedule. Instructors must provide students a window of at least 48 hours during which they can complete this assessment to ensure that it does not conflict with scheduled finals for on-campus courses.
- Individual students may be granted a variance from these policies, provided the instructor is satisfied that the exception is based on good and sufficient reasons, and that such an exception for an early or late examination will not prejudice the interests of other students in the course.

2. Assessment Conflicts: A conflict occurs when a student has two or more final examinations scheduled at the same time. For instances of conflicts, adjustments are made according to this schedule:

- For Fall semester and Summer I semester the course section whose subject code abbreviation is nearest the beginning of the alphabet is adjusted.
- For Winter semester and Summer II semester the course section whose subject code abbreviation is nearest the end of the alphabet is adjusted.
- If the conflicting courses are in the same discipline/subject code, the higher course number is adjusted.
- If the conflict is the result of one course instructor changing their final examination day/time (see Number 4 below), the instructor who changed their day/time must work out the conflicts with their students.

3. Excessive Final Assessments: Excessive final assessments occur when a student has three or more final assessments scheduled in any 24 hour period (or on any day during the final examination period). A course(s) may be moved from the 24 hour period (leaving a maximum of two courses), using the following rules:

- For Fall and Summer I semesters, the course section whose subject code abbreviation is nearest the beginning of the alphabet should accommodate the student.
- For Winter and Summer II semesters, the course the course section whose subject code abbreviation is nearest the end of the alphabet should accommodate the student.
- If more than one course belongs to the same discipline/subject code, the higher course number should accommodate the student.

4. Final Assessment Rescheduling: For those rare circumstances when there is a need to reschedule the final exam for the entire class, the instructor must first obtain the approval of the department chair and subsequently the signatures of all the students enrolled in the class approving of the schedule change, which should be sent to Registration and Records. These approvals must be obtained no later than 30 days prior to the scheduled exam day. Department chairs will ensure that final exam rescheduling is reserved for only rare circumstances. When department chairs approve such requests,
the department must inform the Registrar’s Office and obtain a new
classroom space for the exam.

Students with excessive final examinations may seek accommodation
with the assistance of the Registrar’s Office before the final day of
the regular drop period for the term. When students fail to make
arrangements via the Registrar’s Office by this deadline, accommodation
is not guaranteed. For timely requests, once notified by the Registrar’s
Office, it is the responsibility of the faculty to make reasonable efforts to
provide the student with an alternative examination time.

A student may address complaints related to the final examination
procedures in a course to the chair of the department or the dean of the
college in which the course is offered, or to the Office of the Student
Ombuds.

Grades are due 72 hours after the completion of the final assessment,
with the exception of the final assessments scheduled on the last
day of finals, which are due 48 hours* after the completion of the final
assessment.

*Within 48 of the last schedule final assessment.

Grading System

Grade point averages (scholastic averages) are computed by dividing the
honors points a student has earned by the hours elected. The term grade
point average and the cumulative grade point average are computed for
each student at the end of each term and become part of the student’s
official UM-Dearborn academic record.

Symbols used in the grade reporting system common to all units are: F,
failed (pass/fail option election); I, incomplete; NR, grade not reported;
P, passed (pass/fail option election); S, satisfactory (courses graded S/E
or S/U); NC, no credit; VI, audit; W, drop/withdrawal; X, absent from final
examination; U, unsatisfactory (courses graded S/U only); Y, indicates the
course extends beyond the term.

The grades of E, IE, UE or XE are not assigned honor points and thus will
lower the student’s grade point average. The grade NC is used only for
certain courses. When this grade is officially granted, the grade NC and
lower the student’s grade point average. The grade NC is used only for

Grading Benchmarks

The University of Michigan-Dearborn seeks to provide greater clarification
as to the characteristics for each grade level. The descriptions below
provide general achievement targets for each grade level.

The grading benchmarks do not establish a campus-wide mandate for
faculty grading or grading outcomes. Instructors at the University of
Michigan-Dearborn have the autonomy to formulate their own grading
standards and system. Students should discuss and confirm with their
instructor the grading system and requirements employed within their
course(s).

Note: The A+ and D- grades are not used by Engineering instructors. The
A+ grade is not used by Education instructors.

Grades associated with transfer credit from other schools or colleges
(including other University of Michigan campuses) are neither recorded
nor used in computing grade point averages of students.

Students may repeat a course no more than two times. All grades
received must appear on the transcript, but only the last grade received
is counted in the grade point average (GPA). Please see the appropriate
Graduate Repeat Course Policy (http://catalog.umd.umich.edu/
archives/2019-2020/academic-policies-graduate/exempting-waiving-
repeating-courses/) or Undergraduate Repeat Course Policy (see below)
for more information.

Grades of D- in the College of Engineering & Computer
Science

A grade of D- is not considered passing in any CECS course. If a CECS
student earns a D- in a course from another academic unit it will not
count toward a CECS degree or certificate and must be repeated.

Audit, Pass/Fail, and Non-Credit Courses in the College
of Engineering & Computer Science

CECS students cannot take required courses within their major on an
audit or pass/fail basis. Any course audited or taken pass/fail will not
count towards the degree, even as a general elective. In addition, CECS
students cannot use non-credit courses towards their degree.

Pass/Fail

Up to four courses taken with the pass/fail option — excluding courses
counting towards the major(s), cognates, or minor(s) — by students will
be accepted for credit towards a degree.

Benchmarks

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Point</th>
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</thead>
<tbody>
<tr>
<td>Outstanding</td>
<td>A/A+</td>
</tr>
<tr>
<td>Excellent</td>
<td>A-</td>
</tr>
<tr>
<td>Good Achievement</td>
<td>B+</td>
</tr>
<tr>
<td>Good</td>
<td>B</td>
</tr>
<tr>
<td>Generally Good</td>
<td>B-</td>
</tr>
<tr>
<td>Adequate Achievement</td>
<td>C+</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>C</td>
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<tr>
<td>Sufficient</td>
<td>C-</td>
</tr>
<tr>
<td>Marginal</td>
<td>D+</td>
</tr>
<tr>
<td>Poor</td>
<td>D+</td>
</tr>
</tbody>
</table>
Grading Benchmark Achievement Levels

Superior Achievement (A level)
The grade of A recognizes exceptional performance and achievement that exceeds course expectations and consistently demonstrates, where applicable, many of the following characteristics:

- Thorough, deep, and mature understanding.
- Genuine comprehension, insight, and synthesis.
- Significant mastery of challenging topics and issues.
- Extensive familiarity with relevant literature and previous work.
- Highly developed communication skills.
- Thorough preparation and extensive, thoughtful class participation.
- Integration of knowledge, concepts, and principles across disciplines.
- Originality of analysis and interpretation.
- Technical competence in skills and procedures.
- Precision of ideas and clarity of expression.
- Thinking that is independent, creative, and focused.
- Understanding of nuance and subtlety.
- Consistent coherence in argument and discussion.

Students who receive the grade of A consistently demonstrate, where applicable, the ability to:

- Analyze arguments using specific examples and original sources.
- Think logically, draw inferences, and make predictions in complicated situations.
- Communicate reasoning clearly and concisely.
- Think abstractly.
- Identify strengths and weaknesses in arguments, policies, and practices.
- Integrate information to draw well-founded conclusions.
- Connect course content to issues of other courses and world affairs.
- Use models appropriately; recognize their strengths and accommodate their inherent limitations.
- Foresee and evaluate consequences of proposed policies and actions.
- Use technology creatively and effectively.

Good Achievement (B level)
The grade of B recognizes work that meets course expectations and typically demonstrates, where applicable, many of the following characteristics:

- Clear understanding without much originality.
- Competent grasp of course materials and subject matter.
- Familiarity with relevant literature.
- Competence in communication skills.
- Regular preparation for and participation in class.
- Integration of course knowledge, concepts and procedures.
- Some evidence of critical and creative thought.
- Clear connections between inferences and evidence.
- Care in the use of evidence and quotations with only occasional thinness in argument, detail, or precision.

Students who receive the grade of B typically demonstrate, where applicable, the ability to:

- Extend ideas by connecting with personal experiences, reading, or world events.
- Analyze data in various forms and from varied sources.
- Utilize information to explain events, draw conclusions, and apply results.
- Present comprehensive answers in a clear and logically correct style.
- Understand and compare various models.
- Distinguish inputs from outputs, and causes from effects.
- Recognize consequences of complex interactions.
- Use technology effectively.

Adequate Achievement (C level)
The grade of C recognizes work that is sufficient to prepare for continued study in the field and generally demonstrates, where applicable, some of the following characteristics:

- Adequate grasp of course concepts.
- Partial mastery of knowledge and skills required for understanding.
- Incomplete familiarity with relevant readings or references.
- Writing that lists facts rather than develops well-reasoned arguments.
- Frequent neglect of important information.
- Partial appreciation of the meaning or implications of a questions.
- Answers that are insufficiently developed.
- Minimally complete assignments with many areas for improvement.
Students who receive the grade of C generally demonstrate, where applicable, some ability to:

• Assimilate and communicate simple knowledge and procedures.
• Extend ideas by making simple inferences.
• Make connections among and draw conclusions from course concepts.
• Interpret simple information provided in various formats.
• Organize and display data in tables and graphs.
• Use technology competently.

Limited Achievement (D level)
The grade of D indicates a lack of readiness to continue in the field. Students' work usually demonstrates, where applicable, some of the following characteristics:

• Minimal understanding of the subject matter.
• Poorly developed communication skills.
• Inability to apply subject matter understanding in other contexts.
• Little evidence of critical or creative thinking.
• Lack of apparent seriousness.
• Frequent carelessness in fulfilling assignments.

Inadequate Achievement (E)
The grade of E indicates that course work is insufficient to merit academic credit. Students who receive an E usually demonstrate some of the following characteristics:

• Inadequate understanding of subject matter.
• Inadequate or inconsistent preparation.
• Frequent failure to complete assignments in a timely manner.
• Little evidence of critical thought.
• Very poor communication skills.
• Frequent misunderstanding of facts or references.
• Little or no analysis.
• Confused or incomprehensible writing.

Little or no work offering evidence that course objectives have been met.

Grade Notations
The following notations may appear on a transcript to describe special situations in regard to a course.

NC No Credit. No honor points. Not computed in the grade point average. Used only in specially approved courses that are graded A, B, C. No Credit.

I Incomplete. No honor points. A student whose coursework for the term (other than final examination) is incomplete in a minor way may, upon completion and approval of the I Contract Form, be granted the privilege of completing the work within a five-week period for the College of Engineering and Computer Science or the College of Business, and a four-month period for the College of Arts, Sciences, and Letters and College of Education, Health, and Human Services beginning on the first day of classes of the immediately following term. If granted this privilege, a grade of I will be recorded. Failure to complete the required work within the specified time, or the denial of this privilege by the instructor, may result in a grade of E for the final grade. In extenuating circumstances an extension beyond the stated period may be requested by means of a petition that has been endorsed by the instructor and approved by the Academic Standards Committee. However, such arrangements for completing the work must be made within the above stipulated time period. Failure to complete the required work within the specified time may result in a grade of I being automatically treated as an IE and counted in the student's grade point average. The I will remain on the transcript even after the official final grade is assigned.

X Absent from Final Examination. No honor points. A student who is unavoidably absent from a final examination may be granted the privilege of making up the examination within five weeks beginning from the first day of classes of the immediately following term. If granted this privilege, a mark of X will be recorded. Failure to take the examination within the specified time, or the denial of this privilege by the instructor, will result in a mark of E for the final grade. In extenuating circumstances an extension beyond the stated period may be requested by means of a petition that has been endorsed by the instructor. However, such arrangements for completing the work must be made within the above five-week period. The grade of X will automatically be converted to XE and reflected in the student's grade point average as a failing grade if the Supplementary Grade Report is not submitted by the end of the five-week period.

Y Course extended beyond term end. No credit. No honor points. A mark of Y indicates that a course extends beyond the end of one term. This mark is only used for courses that have been specially designed and approved to extend beyond the end of one term. A course with a Y mark may not be completed after graduation. If such a course is not completed, the Y will be converted to an E upon graduation.

NR Grade Not Reported. No honor points. Student should consult the Registrar immediately.

W Official Withdrawal. No credit. No honor points. Not computed in the grade point average. Students who drop a course or withdraw from all courses for a term before the deadline for official drops and/or withdrawals will receive for these courses the W notation. This notation may not be removed from the transcript.

S/E. Used only for specially approved courses. If a student passes, an S (satisfactory) is awarded. It is not computed into the grade point average. If a student does not pass, an E is awarded. If a student stops attending, without officially dropping, a UE is awarded. Both the E and the UE are computed in the GPA as failing grades. (Exception: Failing grades in additive credit courses that are graded S/E have no impact on the GPA.)

P/F Pass/Fail Option. No honor points. A student must elect to take a course under the Pass/Fail option.

UE Unearned Fail. This grade is assigned to any student who has never attended, or stopped attending class during the semester and did not officially drop. It is computed in the GPA the same as an E.

VI Visitor-Official Audit. No credit. No honor points. Not computed into the grade point average. An official audit, or visitor status, allows
Change of Grades

The grade that an instructor records on the final grade sheet and that appears on the student's subsequent transcript is assumed to be final; that is, the instructor's official evaluation of all of a student's performance and work completed by the official end of the term (the last day of the final examination week).

The University permits a change of grade under the following circumstances:

- Recognizing that mistakes can be made, the University of Michigan-Dearborn permits a student to ask an instructor for a review of a grade within a five week period after the end of the term involved. After the expiration of this deadline, a student may initiate a request for a review only through the petition process involving the student's college Academic Standards Committee (or comparable group), whose decision shall be final. Such a review is entirely separate and distinct from the circumstances involving an X (Absent from Final Examination), I (Incomplete Coursework), or a Y (Course Extends Beyond Term).
- A student (or instructor) may initiate a grade change if the student discovers that a grade has been entered in error due to, but not exclusive to, the following:
  - possible omission by the instructor when computing the final grade, or material submitted by the student before the end of the term;
  - possible error in evaluation by the instructor of work submitted or final examination taken by the student before the end of the term;
  - possible error by the instructor in the computation of the final grade;
  - possible error in the recording of the grade by the instructor or staff; or
  - allegation of bias or prejudice on the part of the instructor in the assignment of the final grade. (This rare charge is to be handled according to the procedures established within the academic unit.)

Grade and Academic Grievances

All colleges follow the following process when handling student complaints related to grades:

1. The initial complaint regarding a course grade or assignment within a course shall be directed to the instructor.
2. If the instructor determines that no change of grade should occur, the student may request the department chair to mediate a resolution.
3. If the issue cannot be resolved at the department level, the student may petition the dean's office requesting a hearing on the matter.

Specific policies may differ between colleges and departments. Please see the following for each college:

- The College of Arts, Sciences, and Letters has adopted its own college-wide and department-level grade appeal and change policies (https://umdearborn.edu/casl/undergraduate-programs/advising-student-records/policies-and-procedures/grade-appeal-policies/).
- Each department in the college has its own procedure for resolving grade complaints.
- The College of Engineering & Computer Science uses an Academic Grievance Policy (https://umich.app.box.com/s/ds21nulpo4ylmmb8m5ggb9anu7ti392/) to manage student complaints related to grade disputes.
- The College of Business has a Grade Change and Grade Grievance Policy and Procedures (https://drive.google.com/file/d/0BxdK3tGusupSYTRjNGI1bnFiY2M/view?usp=sharing).
- The College of Education, Health, and Human Services uses their Grade Change and Grade Grievance policy (https://umich.app.box.com/s/6ol812gmsidksi8t9afo79ay0fpzlph/) for resolving grade complaints.

Repeating a Course (Undergraduate)

Students may repeat a course no more than two times. All grades received must appear on the transcript, but only the last grade received is counted in the grade point average (GPA).

Guidelines:

When a prior grade or mark other than "W" is recorded for a course a subsequent enrollment ("repeat") of the course, or its equivalent, or its cross-listing, will result in an adjustment of the grade point average and credits earned.

1. Students may repeat a course up to two times (total of three attempts).
2. Regardless of whether it is higher or lower than the previous grade(s), the last grade assigned in a course will be used in computing the student's cumulative grade point average and credits earned toward degree.
3. If a student takes a course three times (the maximum allowed), the previous two grades will not be reflected in the GPA.
4. Most courses can be elected only once for credit. The maximum number of credits/elections allowed in courses designed for multiple enrollments are indicated in the Undergraduate Announcement. For information regarding these courses, students may contact their Unit Academic Advisor.

This policy applies to all undergraduate degree and non-degree students in all academic units.

The policy applies only to courses elected Fall 2005 or later. Students who have repeated a course two or more times prior to Fall 2005 may repeat the course only one additional time. Only the two most recent previous grades will be affected by the new policy. Other previous grades will continue to be used in computing the grade point average.

Courses taken at institutions other than UM-Dearborn do not affect the grade point average.

The use of an Audit Grade Mode or Pass/Fail Grade Mode may not be used to adjust grade point averages for courses previously elected under any other existing grade mode.
For students who earned an undergraduate degree at UM-Dearborn and are now in the process of earning a second undergraduate degree at UM-Dearborn, the following rule will apply: If repeating a course in the second degree that was failed (with a grade of E) in the first degree, both course will be included in the GPA calculation and the course earned hours (assuming the course was passed) will be included in the earned hours of the second degree.

The limitation of the three-course rule will be monitored by the Office of Registration. Students who elect a course more than three times will be dropped from the course and notified of the election change.

**Statement of Academic Integrity & Academic Integrity Database**

The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct, as well as policies established by the schools and colleges. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses. Violations will not be tolerated and may result in penalties up to and including expulsion from the University.

**Academic Integrity Database**

The University of Michigan-Dearborn maintains a database on academic integrity violations. The purpose of the database is to properly track and record Academic Code of Conduct violations committed by students so a college knows when a student has committed two or more violations.

These violations are considered part of a student's academic record until they are expunged. The removal of an Academic Code of Conduct violation does not occur until a student graduates from the University of Michigan-Dearborn or after eight years from the initial violation, whichever comes first.

**Withdrawal Policy**

A student who first registers and then withdraws from two consecutive terms may be placed on academic probation and may not register without the explicit written permission of the Associate Dean or the Associate Dean's representative.

A student who is required to withdraw from one academic unit may not be admitted to another UM-Dearborn academic unit within the same term that the withdrawal action was taken.

**Required Withdrawals**

Unless extenuating circumstances are presented by petition, a student who is required to withdraw from one academic unit may not be admitted to another UM-Dearborn academic unit within the same term as that in which such withdrawal action is taken.
ACADEMIC POLICIES - UNDERGRADUATE

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Academic Standing, Probation, Dismissal, and Reinstatement (p. 1069)
Class Standing (p. 1070)
Continuous Enrollment (p. 1070)
Course Load (p. 1071)
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Foreign Language Placement Exam (p. 1074)
Taking Courses at Another College or University (p. 1075)
University Undergraduate Degree Requirements (p. 1075)

Academic Honors

William J. Branstrom (Freshman) Prize

First-term freshmen who rank in the upper five percent of their class and earn 14 credit hours and at least a 3.50 GPA on any campus and in any unit of the University of Michigan are named recipients of the William J. Branstrom Prize. This distinction is noted on the student’s transcript as “William J. Branstrom Prize.”

James B. Angell Scholars

Students who earn straight A’s (A+, A, A-) for two or more consecutive terms with a minimum of 14 elected credit hours each term, 12 of which must be graded, are named James B. Angell scholars. This distinction is noted on the student’s transcript.

University Honors

University Honors are awarded to all students who have achieved a 3.50 GPA and 14 credit hours (12 of which must be graded A-E). This distinction is noted on the student’s transcript as “University Honors” after fall and winter terms only.

Honor Scholars Recognition

The Honor Scholar Award is presented each year to the one active undergraduate student per degree program with at least a 3.3 cumulative grade point average and a minimum of 90 credit hours earned by Fall term. Award recognition is also presented to one active graduate student per degree major with at least a 3.7 cumulative grade point average and a minimum of three-quarters of their program completed by the end of Fall term. The student, selected by the respective discipline faculty, also meets other criteria established by department, school or college including contributions to the discipline through research and service activities such as tutoring, mentoring and leadership in discipline based student organizations.

Dean’s Lists

College of Arts, Sciences, & Letters Dean’s List
A student is honored by inclusion in the Dean’s List if they meet two conditions:
1. complete at least 12 credit hours of graded coursework towards a degree during the term.
2. achieve a 3.50 or higher term GPA.

The Dean’s List is compiled after the Fall, Winter, and Summer terms. A part-time Dean’s List is compiled after the Fall and Winter for students who meet the following conditions:
1. complete at least a combined 12 credit hours over the course of the Fall and Winter of a given academic year, maintaining part-time status in each semester.
2. the 12 credit hours must be graded coursework towards a degree.
3. earn a minimum 3.50 GPA each term.

College of Business Dean’s List
A student is honored by inclusion in the Dean’s List if the student meets two conditions:
1. has completed at least 12 credit hours in graded coursework toward a degree during the term, and
2. has achieved a 3.50 or better term GPA. The Dean’s List is compiled after the fall, winter, and summer terms.

College of Engineering & Computer Science Dean’s List
Students in CECS programs receive Dean’s list recognition for the semester in which they are enrolled full-time in courses that fulfill their degree requirements and achieve a term GPA of 3.5 or higher.

College of Education, Health, and Human Services Dean’s List
At the end of each term, full-time students earning a GPA of 3.5 or better while carrying a minimum course load of 12 earned GPA hours will be added to the CEHHS Dean’s List. Part-time students earning a GPA of 3.5 or better while carrying a combined total of 12 GPA hours for the fall and winter term will be added to a combined Fall/Winter Dean’s List.

Academic Standing, Probation, Dismissal, and Reinstatement

Good Scholastic Standing

To be in good scholastic standing at the end of any term, a student must have an overall average of 2.0 or higher for all UM-Dearborn courses elected.

Neither credit nor grade points are allowed for a course in which a student received an E grade. Any deficiency of grade points (below 2.0
average) resulting from one or more E grades must be made up while enrolled before the student is restored to good standing. A required course in which a grade of E has been assigned must be repeated on this campus during the student’s next academic term.

**Unsatisfactory Performance**

The records of students are reviewed at the end of each term by the Academic Standing Committee. Three degrees of scholastic deficiency are used by the Committee to identify a student's unsatisfactory performance resulting from poor grades: warning, on probation, or required to withdraw. In cases where the grade average for one term falls below 2.0 while the overall average remains above 2.0, the student normally will receive a warning letter from the Committee.

**Probation**

Probationary status (academic probation) is normally assigned to students who are not in good scholastic standing but whose records indicate a possibility for removal of deficiencies by continued enrollment. Students on academic probation are restricted to registering for no more than 13 credits per semester.

Students whose academic record is poor for two or three successive semesters are required to withdraw from the university. Students who have been required to withdraw may submit a formal written appeal to be readmitted at a later time, but must, in all cases, have had at least one semester of non-enrollment for their appeal to be accepted for consideration.

**College of Business**

While any D grade (D, D-, D+) is passing, it is not considered satisfactory performance. Any deficiency of grade points (below 2.0 overall average) resulting from one or more D grades must be made up before the student is restored to good standing. If the student receives a D grade in a course that is an important prerequisite for other courses, it is recommended that the course be repeated.

**College of Education, Health, and Human Services**

The College of Education, Health, and Human Services reviews the records of all its degree students at the end of each term. If a certification student’s grade point average for one term drops below 2.75, the student is placed on academic probation and may not register for education methods courses in the professional sequence. If the overall average remains below 2.75 for another term, the student must maintain a grade-point average of at least 2.0.

**Academic Standing Appeals**

Students who wish to appeal decisions on their academic status, made by a unit’s committee on academic standing, may do so by addressing a petition to the executive committee of the unit in which they are admitted. If a negative decision is rendered, the student may, under unusual circumstances, appeal to the Provost Office.

**Consecutive Withdrawal**

A student who first registers and then withdraws from two consecutive terms may be placed on academic probation and may not register without the explicit written permission of the Associate Dean or the Associate Dean’s representative.

A student who is required to withdraw from one academic unit may not be admitted to another UM-Dearborn academic unit within the same term that the withdrawal action was taken.

**Required Withdrawals**

Unless extenuating circumstances are presented by petition, a student who is required to withdraw from one academic unit may not be admitted to another UM-Dearborn academic unit within the same term as that in which such withdrawal action is taken.

**Academic Reinstatement Policy**

The academic reinstatement process is designed to facilitate the return to good academic standing of students who have been dismissed and are seeking to re-enroll at UM-Dearborn. Reinstatement, however, is not automatically granted but is a privilege granted to former students at the discretion of the academic unit.

A former UM-Dearborn student is eligible for academic reinstatement, after an absence of one semester, if the student:

1. Had a cumulative grade-point average of less than 2.0 during their previous enrollment at UM-Dearborn;
2. Provides a petition which demonstrates an improved academic performance or a readiness for academic success;

A former UM-Dearborn who is dismissed a second time will be eligible to petition for reinstatement after a period of one-academic year.

All petitions granted are subject to a probation period of at least two semesters where the student must maintain a grade-point average of no less than 2.0. If a student fails to maintain the minimum grade-point average during that period then the student will be immediately placed on probation (see above).

**Class Standing**

Class standing is determined by the total credits earned that apply toward the students’ degree program. The various classifications are as follows (numbers indicate semester hours):

<table>
<thead>
<tr>
<th>Standing</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>(0-24)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>(25-54)</td>
</tr>
<tr>
<td>Junior</td>
<td>(55-84)</td>
</tr>
<tr>
<td>Senior</td>
<td>(85+)</td>
</tr>
</tbody>
</table>

**Continuous Enrollment**

Students whose degree requirements are not completed and who have not been granted a temporary leave must register and maintain continuous enrollment. If a student does not maintain continuous enrollment for one calendar year or who has withdrawn for two consecutive semesters must apply for readmission and may not re-register without the permission of the student’s academic college.
Such students who have been readmitted are governed by requirements and regulations in effect at the time of readmission.

Since all I and X marks are permanently changed to IE and XE after four months, a readmit may not petition to make up I's or X's on their prior record.

Courses taken at other campuses will not count automatically toward graduation. Students should petition their academic unit for credit(s). Maximum transfer hours apply (see “Transfer Equivalency Worksheet” section).

Readmitted students complete a Readmission Form available to download at umdearborn.edu/ddc (http://www.umdearborn.edu/ddc/) and submit it directly to the academic unit in which they wish to enroll. Readmitted students are subject to the requirements in effect at the time of readmission. If students want to change their program of study, they should contact the academic unit of the program to which they would like to change.

Course Load

Students must have permission from their college advising office to elect more than 18 credit hours a term. Students whose GPA is below 3.00 are not allowed to elect more than the maximum of 18 hours.

Credit by Examination

The UM-Dearborn will acknowledge proficiencies gained by students outside the bounds of traditional courses if such proficiency is certified by recognized examinations or departmentally prepared and/or approved alternatives. The University recognizes two types of such special examinations: 1) standardized examinations prepared and evaluated by nationally recognized organizations; and 2) placement examinations prepared, administered on campus, and evaluated by UM-Dearborn academic departments.

Standardized National Examinations

The Advanced Placement (AP) and International Baccalaureate (IB) subject examinations are the chief examples in this category. If the relevant academic units and/or the academic departments award credit, the student is responsible for having the test results sent to the institution and the Office of Registration (current students) or the Office of Admissions and Orientation (for incoming students) will be responsible for the recording of the appropriate credit. The student is not charged a fee for such credit.

Credit for Cooperative Education, Independent Study and Other Experiential Courses

No more than 18 hours of credit may be counted toward graduation for cooperative education, independent/directed research, independent/directed studies, and internships.

Credit for Education in the Armed Forces

Effective Fall 2015 for new admits, veterans who have served in the armed forces may receive 2-6 general credits toward degree for their basic recruit training if an honorable or general discharge was granted. The hours granted vary according to the ACE recommendations for credit based on the military branch of service. Additional Specialist Training credit may be petitioned for credit via a written petition during the first semester on campus. Veterans should meet with their academic unit to discuss possible options, write a petition, and arrange to meet with a discipline representative or department chair to review the military coursework and experience. Based on the discussion and ACE recommendations, specific credit would be granted in the first semester after admission by the discipline representative or department chair through the academic unit advising office.

UM-Dearborn has a cap of 62 transfer hours from an accredited community college. The same cap is applied for all ACE credits. This includes the general credit granted for basic recruit training for veterans. If a veteran attended the Community College of the Air Force the cap of 62 hours toward degree includes the general credits, attendance at the Community College of the Air Force and all petitioned credit to degree.

Credit for Military Officer Education

College of Arts, Sciences, and Letters and College of Education and Health and Human Services

Up to six credit hours of Military Science / Aerospace Studies / ROTC coursework may count as elective credit toward degree.

College of Business

Up to six semester credit hours will be granted to a student for successful completion of advanced military science courses towards the BBA degree requirements.

College of Engineering and Computer Science

Students who satisfactorily complete the requirements as established by the Military Officer Education Program Chairman for a commission and satisfactorily complete the engineering program of studies may count a maximum of four credit hours of advanced military science courses (300 and 400 level) as meeting program elective hours for an engineering degree at the discretion of the academic department.

Dearborn Discovery Core (General Education)

The campus-wide general education program (known as the Dearborn Discovery Core) at the University of Michigan-Dearborn is designed to complement work in a student’s chosen area of study. These classes serve as a means of discovery for students, providing a foundation for learning, connecting to potential new areas of interest and building tools for success in whatever field a student pursues. The Dearborn Discovery Core is divided into three sections in order to accomplish the six goals for undergraduate student learning: Foundational Studies, Areas of Inquiry, and Capstone Experience.

Foundational Studies

- Written and Oral Communication (6 credits)
- Upper-Level Writing Intensive Course (3 upper-level credits)
- Quantitative Thinking and Problem Solving (3 credits)
- Critical and Creative Thinking (3 credits)
Areas of Inquiry

- Natural Science (7 credits with a lab)
- Social and Behavioral Analysis (9 credits)
- Humanities and the Arts (6 credits)
- Intersections (6 upper-level credits)

Capstone Experience (3 credits)

Transfer Placement Policy

Only exact transfer equivalencies of courses approved by the Dearborn Discovery Core Subcommittee may be used to fulfill Dearborn Discovery Core requirements.

Readmit Policy

Students who were last enrolled between Fall 2015 and Summer 2017 and have no more than four courses or twelve credit hours to take in order to graduate have the option of returning under their college's old general education program or the Dearborn Discovery Core. Students who choose to return under their college's old general education program may only take advantage of this readmittance policy one time, and they must successfully complete the remaining courses. All other readmitted students and all transfer students entering the University of Michigan-Dearborn will come under the Dearborn Discovery Core requirements.

Students may petition for an exemption to the Readmit Policy if they satisfy only one of the criteria components:

1. were last enrolled at the University of Michigan-Dearborn between Fall 2015 and Summer 2017; or 
2. have no more than four courses or twelve credit hours to take in order to graduate.

In addition, students must submit a rationale that provides a well-stated and reasoned explanation to the Dearborn Discovery Core Subcommittee for why it should approve an exemption to the policy.

Pass/Fail Policy

Courses taken with the pass/fail option by students will be accepted for credit within the Dearborn Discovery Core program. The default limit of pass/fail courses shall be 4.

Minimum Grade Policy

A student can satisfy a Dearborn Discovery Core category with a passing grade of D- in a Dearborn Discovery Core course. A student still must have an overall minimum grade point average of 2.00 in their block of Dearborn Discovery Core courses.

Transferring Quarter-Hour Credit Courses

Students transferring in a quarter-hour credit course may satisfy a specific Dearborn Discovery Core requirement. Students transferring in quarter-hour credit courses must still meet a minimum of 30 credits of Dearborn Discovery Core requirements.

Evaluating Transfer Courses for Credit

If a transfer course is in the Michigan Transfer Agreement and given exact equivalency for lower-level credit, then the university will grant the same transfer credit to all students and the course will count toward the relevant DDC category. For transfer courses not in the Course Transfer System that a student seeks to petition for DDC credit, the college advising office will send the petition to the discipline faculty for evaluation. The following list provides the results of the faculty evaluation process:

- If the faculty evaluates the petition as an exact equivalency for a UM-Dearborn course already in DDC, that course will qualify for DDC category(s) credit.
- If the faculty evaluates the petition as an exact equivalency for a UM-Dearborn course not in DDC, the course will not qualify for DDC credit.
- If the faculty evaluates the petition as Lower Level credit in the discipline, then it will automatically qualify for DDC credit in the category associated with the discipline (this outcome parallels how the Michigan Transfer Agreement operates).
- If the faculty evaluates the petition as General Credit, then the course will not qualify for DDC credit.

Transfer Course Credit for Intersections Category

If the college advising office grants the transfer course an equivalency for a specific UM-Dearborn course that is already approved for the Intersections category, then the student will receive Dearborn Discovery Core Intersections credit, and no petition is necessary. A student may receive all 6 credit hours of the Intersections requirement in this manner. If the college advising office grants the transfer course general upper-level credit, then the student would need to submit a petition to the Dearborn Discovery Core Subcommittee to have the course considered for Intersections credit. If the subcommittee finds that the evidence is insufficient and it cannot make a determination, the student has an opportunity to resubmit additional course materials for review, within one year of the first petition. The student may resubmit materials in support of a petition one time. Only 3 of the 6 credit hours Intersections requirement may be fulfilled using this petition process.

Degree and Program Definitions

Major

A major represents a degree-seeking student's primary field of study which embodies a structured plan of study requiring a minimum of 30 credit hours. The major appears on a student's official transcript. Courses taken to fulfill requirements for a major cannot also be applied to fulfill the requirements of a minor.

Declaring a Major

All students are required to declare a major when they reach 60 credit hours. Students transferring 62 credit hours or more are not required to declare a major before admission, but must do so during their first term at UM-Dearborn.

Double Major

Students who want a double major must meet all requirements in two fields and must officially declare, and be approved for, both majors. Courses that satisfy major and/or cognate requirements for more than
one field can be applied simultaneously to both fields. The business studies major may only be a second major.

Degree
A bachelor's degree at the University of Michigan-Dearborn is an award given for the completion of a series of courses and other requirements and requires at least 120 credit hours along with a focus of study within a major that is at least 30 credit hours for its completion.

For the definition of a second/dual degree and concurrent degree please see below.

Bachelor of Arts (AB)
A Bachelor of Arts degree usually encompasses an array of courses drawn from the liberal arts disciplines. The degree is intended to create a well-rounded program of study and should give students a broad perspective of the world through the study of diverse topics.

Bachelor of Science (BS)
A Bachelor of Science degree has a strong focus of study within the STEM fields (science, technology, engineering, and mathematics), or the applied sciences (social, behavioral, and health sciences). The degree emphasizes technical knowledge and scientific methodologies, including professional and practice-based skills learning, along with the requirement of a strong general education program in the Dearborn Discovery Core. Individual programs of study and majors define their own specific requirements for the degree. At a minimum, a Bachelor of Science degree shall have at least 40 credit hours of coursework (at least 20 credit hours of which are in upper-level courses 300 or above) in specified STEM or applied sciences fields.

UM-Dearborn Bachelor of Science Requirements:
- A minimum of 120 credits
- Completion of Dearborn Discovery Core course requirements
- A focus of study in the STEM fields (science, technology, engineering, and mathematics)
- At least 40 credit hours of coursework (at least 20 credits of which are in upper-level 300 or above) in specified STEM or applied sciences fields

Bachelor of Business Administration (BBA)
The Bachelor of Business Administration (BBA) is a professionally oriented degree that is designed to impart the knowledge and skills, and develop the diversified competencies required to manage and lead modern business enterprise. It also provides a rigorous preparation for graduate study in business or a variety of related areas.

To satisfy the requirements of the BBA program students must complete prerequisite courses developing fundamental skills in business analysis, writing, and mathematics as well as core courses providing a broad background in the functional areas of business. Students then choose a major field of study in which they develop an in-depth understanding of a business field. Further enhancements such as a second major, minor, or specialized certificate are also possible.

Bachelor of Science in Engineering (BSE)
The Bachelor of Science in Engineering (BSE) degrees, offered by the College of Engineering and Computer Science, provide rigorous engineering education built on a foundation in engineering principles, basic science and mathematics. The degrees deliver discipline specific knowledge that prepare graduates to model, analyze, design and realize systems, components and/or processes. Additionally, the BSE degrees emphasize ethical and professional responsibilities, communication skills, team work, and skills for acquiring and applying new knowledge. The BSE curricula are developed to fulfill the accreditation requirements of the Engineering Accreditation Commission of ABET.

UM-Dearborn BSE Requirements:
- A minimum of 120 credit hours
- A foundation in mathematics and science that fulfills the ABET accreditation requirements.
- A minimum of number of engineering and discipline specific topics that fulfill the ABET accreditation requirements.
- A culminating capstone design experience.

Concentration
A concentration is a structured plan of study within a major. The number of credit hours required for a concentration varies, but is included within the required credit hours for the major. If successfully achieved, the concentration appears on a student's official transcript.

Minor
A minor is an approved, coherent concentration of academic study in a single discipline, involving at least 12 hours in courses numbered 300 or above in a particular area of study. Minors are recorded on students' transcripts at the time the petition is granted.

Students in most majors may pursue one or more minors and, upon successful completion of the prescribed course work, have that accomplishment officially recognized on their transcript through established verification procedures that all requirements for the minor have been met and the college of the student's major allows the official recognition of the minor.

Certain major and minor combinations may be deemed inappropriate either by the college or department of the major or minor. Courses taken as part of a minor may not count toward both a major degree and a minor. Courses taken as cognates can, however, be counted towards the requirements for a minor.

No more than three credit hours of transfer credit, field placements, internships, seminars, S/E-graded courses, and independent study/research may be applied to a minor.

A minimum grade point average (GPA) of 2.00 is required in the courses applied to a minor. The grades (including E's) in all upper-level courses in the discipline of the minor will be reflected in the minor GPA. Courses elected pass/fail (P/F) cannot be used in a minor. Courses used in a minor cannot dually be used in a major.

Undergraduate Certificate
An undergraduate certificate is a non-degree credential, less extensive than a degree program, which is designed to provide students with a specialized set of courses that supplement a primary field of study, area of expertise, or provide an interdisciplinary experience within a defined body of knowledge. Certificates are encouraged in areas not currently
addressed by an undergraduate degree program and where they might provide added benefits to students beyond existing degree programs. Certificates can be created within specific disciplines or departments, college-wide programs, across departmental/college boundaries with the issuing college having the responsibility for administering/monitoring the certificate program.

Degree-seeking and non-degree students may pursue an undergraduate certificate from the University of Michigan-Dearborn:

1. **Degree-Seeking:** Undergraduate students enrolled in a degree program have the opportunity to complete an undergraduate certificate. The student must formally declare the certificate program by completing a Declaration of Certificate Form during their enrollment in a degree program. Students can earn the certificate before obtaining their UM-Dearborn undergraduate degree if the certificate approval permits. Students must complete a Certificate Completion Application during the term in which they will be completing the certificate requirements. Program faculty must stipulate in their formal proposal whether the certificate can be posted before degree completion (Stand-Alone) or only upon degree conferral (Linked), along with any additional criterion needed to declare and pursue a certificate program.

2. **Non-Degree:** Non-degree students may pursue a certificate comprised of a distinct set of courses not wholly aligned with an existing degree program. Non-degree students interested in a certificate program should apply directly through standard non-degree seeking admissions procedures. Students who wish to obtain their certificate must complete the Certificate Completion Application during the term in which they will be completing the certificate requirements. Admissions stipulations regarding certificate programs must be provided in detail in the formal proposal.

All University of Michigan-Dearborn certificate programs must follow the below criteria:

- All students are required to complete a minimum of nine (9) undergraduate credit hours in order to receive any UM-Dearborn certificate and must meet the specific GPA minimum established for the certificate. Individual colleges or programs may specify a higher minimum credit hour requirement.

- Students may transfer from another accredited institution into a UM-Dearborn certificate program up to half of the credit hours required by the certificate, but no more than six (6) credit hours of credit. If a certificate requires nine (9) credits of coursework, only four (4) credits can be applied towards the certificate.

- If a certificate program permits its courses to be taken Pass/Fail, no more than a fourth of the credit hours can be taken as Pass/Fail.

- All applicable credits earned in the certificate program can be applied toward a University of Michigan-Dearborn degree program.

- Non-degree seeking students shall only take credits that apply for the certificate program they have been admitted.

**Second Bachelor's Degree**

Applicants pursuing a second Bachelor's degree must submit the Application for Undergraduate Admission and Scholarships and meet the same admission requirements as transfer students. Each of the four academic schools and colleges of the University have their own admission criteria:

<table>
<thead>
<tr>
<th>College</th>
<th>GPA Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colleges of Arts, Sciences, &amp; Letters</td>
<td>2.50</td>
</tr>
<tr>
<td>College of Business</td>
<td>2.70</td>
</tr>
<tr>
<td>College of Engineering &amp; Computer Science*</td>
<td>2.75</td>
</tr>
<tr>
<td>College of Education, Health, &amp; Sciences**</td>
<td>2.75</td>
</tr>
</tbody>
</table>

*Students must also have a 2.75 recalculated math, science, and engineering GPA.

**Several select programs within CEHHS have a 2.50 GPA requirement. Contact the Office of Admissions and Orientation for more details.

## Placement Exams

### English Placement Exam

The English Placement Exam is required of all students upon entering UM-Dearborn. Freshmen must take the placement exam before orientation. Transfer students must take the placement exam within the first semester of enrollment at UM-Dearborn. A student who does not take the placement exam within the specified time period will be given a hold which will prevent registration. The exam may only be taken once.

In order to appeal the results of a placement exam, a student may submit a portfolio for consideration by the Writing Program. Appeals must be submitted by the end of the last week of classes in the first semester a student is enrolled. Any student who has not taken the English Composition Placement Exam prior to the sixth week of their first enrolled semester will be given 8 weeks from their exam date to submit an appeal. Submission of a portfolio does not guarantee a successful appeal.

### Mathematics Placement Exam

The Mathematics Placement Exam is required of all freshmen before they register for a mathematics course.

Transfer students are also required to take the placement exam before they register for a mathematics course unless they fall within one of the college-specific exemptions listed below:

- College of Engineering and Computer Science students who are transferring in the UM-Dearborn equivalent of Calculus I (Math 113/115) or higher with a "C" or better, are not required to take the exam.

- If you are in the College of Business and you are transferring in the UM-Dearborn equivalent finite math, college algebra (Math 080), or Pre-Calculus (Math 105) with a "C" or better, it exempts you from the exam.

- If you are in the College of Education, Health, and Human Services and are not a Mathematics major or minor, you are exempt from the exam.

- If you are in the College of Arts, Sciences, and Letters and you are transferring in the equivalent of Pre-Calculus (Math 105) and higher or you plan to take Math 131 (Conceptual Mathematics), you are exempt from the exam. However, if you are enrolled as a Math or Secondary

### Mathematics Placement Exam Exemptions

- If you are in the College of Arts, Sciences, and Letters and you are transferring in the equivalent of Pre-Calculus (Math 105) and higher or you plan to take Math 131 (Conceptual Mathematics), you are exempt from the exam. However, if you are enrolled as a Math or Secondary
Education Math major/minor and are not transferring in Pre-Calculus, you will need to take the exam.

All students can take the Mathematics placement exam up to three times (with 30-day wait periods).

Foreign Language Placement Exam
The Foreign Language Placement Exam is strongly encouraged of all College of Arts, Sciences, and Letters students. Placement exams are offered in French, German, and Spanish as a computer-based exam, and Arabic as a paper-based exam. It will take approximately 2-3 weeks to receive your placement exam results in the mail.

Taking Courses at another College or University
Degree-seeking students in good academic standing may take courses as guest students elsewhere at another college or university. In so doing, students must adhere the following terms and conditions:

• Only those undergraduate courses earned at institutions that are regionally accredited or from a foreign university or college approved by the government or the official regulating agency of the country will be considered for transfer credit at UM-Dearborn;

• The University’s Transfer Residency Requirement policy (see Section 2.1.2);

• A course may not transfer if a student is electing the course already completed at UM-Dearborn;

• Transfer courses will not alter a student’s UM-Dearborn GPA;

• For final posting of a course, an official transcript is required;

• Courses taken at another university must meet all required course equivalencies as stated in the transfer residency requirements policy.

University Undergraduate Degree Requirements
Graduation Requirements
Undergraduate degree requirements consist of Dearborn Discovery Core, minimum grade point averages, minimum credit hours, placement exams, and a senior-residency requirement. Undergraduate students must elect to follow (a) the degree requirements in the catalog current in their first term of enrollment after admission or readmission or (b) degree requirements in a subsequent catalogue as long as they were enrolled in a term in which it was in effect. Students may not mix catalogs.

Minimum Total Credit Hours and Grade Point Average
A minimum of 120 credit hours with an overall average of C (2.00) or better is required for graduation.

Upper-Level Coursework
A minimum of 48 hours of upper-level (courses numbered 300-499 and 3000-4999) coursework must be completed by each student.

College of Engineering and Computer Science Upper-Level Coursework
Students in the College of Engineering and Computer Science must complete at least 30 credit hours of upper-level CECS course work at UM-Dearborn of the degree program in which enrolled.

Major Credit Hours Requirement
A student must successfully complete at least half of the credit hours required for a major at the University of Michigan-Dearborn.

Senior Residency for a Degree
In order to qualify for an undergraduate degree at the University of Michigan-Dearborn, a student can take no more than the equivalent of two courses of the students’ last 36 credits for a degree at another higher education institution. Restrictions on maximum transfer credit hours must be observed.

Transfer Residency Requirement
Transfer students must complete at UM-Dearborn the last 30 to 58 credit hours before graduation. The precise number depends on the previously attended institution(s) and the maximum number of transferable credits. Institutions are classified into three categories: (2Y) includes all two-year institutions, (4Y) includes all four-year institutions other than the schools and colleges of the University of Michigan, (UM) includes only the schools and colleges of the University of Michigan. The table below gives the minimum residency requirements for transfer students.

<table>
<thead>
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<td>4Y &amp; UM</td>
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<td>2Y, 4Y, &amp; UM</td>
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Advanced Placement, International Baccalaureate and A level coursework is treated the same as coursework from a four-year institution.

Foreign Language Requirement for the College of Arts, Sciences, and Letters
The College of Arts, Sciences, and Letters requires all students to satisfy its foreign language distribution requirement in order to obtain a degree. The requirement can be met by:

• Successfully completing a two-semester beginning language sequence at UM-Dearborn, or

• Receiving the approval from the college to transfer the equivalent of 8 semester hours of a beginning language sequence from another institution, or

• Successfully completing a 3 or 4 hour foreign language course (not taught in English) at the 102 level or higher, or

• Completing at least 3 years of foreign language (in the same language) in high school with a grade of “C” or better in the final course. Submit a petition.
Those students who wish to meet the college’s foreign language requirement based on study or experience other than that outlined above may do so by:

• Completing the equivalent of a high school degree from a school that used a language other than English for instruction. (Appropriate documentation attesting to the language of instruction and graduation from the high school program is necessary and official English translations of foreign transcripts are required. *Submit a petition.), or

• Passing an oral and written foreign language proficiency exam.

**Dual Degree Requirements**

Students may complete two or more degrees at UM-Dearborn at the same time. To earn both degrees, students must meet the requirements for each degree and earn at least 30 credit hours (at least a minimum of 150 credit hours) beyond the first degree (regardless of the number of credit hours completed for the first degree), if the first degree was earned at UM-Dearborn.

**Second Degree Requirements**

If a student chooses to complete a second degree as a post-baccalaureate student, then that student must complete an additional 45 credit hours beyond the first degree (regardless of the whether the degree was earned at UM-Dearborn or elsewhere). The GPA for the second degree will be based on the cumulative academic records of all courses taken at UM-Dearborn.

**Second Degree Requirements for Post-Baccalaureate Students in the College of Business**

Satisfactory completion of the BBA Prerequisite Requirements, Dearborn Discovery Core, BBA Core, and major coursework required for the degree sought.

Satisfactory completion of at least 30 semester hours of coursework while enrolled in the College of Business as a post-baccalaureate student; at least 21 hours of this course-work must be in courses offered by the College of Business.

Achievement of at least a 2.0 grade point average in all coursework and in courses offered by the College of Business.

**Concurrent Degrees**

UM-Dearborn also offers concurrent degrees for students where the two degree programs overlap significantly in course content. In order to obtain the concurrent degrees, students must complete at least 15 credit hour beyond the degree with the highest required credit hours. Both degrees must be earned at the same time.

**Graduation Honors**

**Chancellor’s Medallion**

The Chancellor’s Medallion is awarded at each Commencement Exercise to UM-Dearborn graduates. The students are selected based on their quality of character, vitality, intellect, integrity and academic record. The December awardees are selected from August degree recipients and December degree candidates. The April/May awardees are selected from April/May degree candidates.

**With Distinction**

Students who graduate and have obtained a cumulative grade point average of at least 3.2 but less than 3.6 are recommended for graduation “With Distinction”. Such distinctions are noted on transcripts and diplomas.

**With High Distinction**

Students who graduate and have obtained a cumulative grade point average of at least 3.6 are recommended for graduation “With High Distinction”. Such distinctions are noted on transcripts and diplomas.
ACADEMIC POLICIES - GRADUATE

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Accelerated Masters Programs (p. 1077)
Exempting, Waiving, and Repeating Courses (p. 1078)
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Graduate Dual Degrees (http://catalog.umich.edu/academic-policies-graduate/grad-dual-degrees/)
Graduate Guest/Non-Candidate for Degree (p. 1080)
Graduate Program Completion Requirements (p. 1080)
Research, Thesis, and Dissertations (p. 1080)
Transfer Credit Policy (p. 1081)

Academic Actions and Exceptions

Good Academic Standing

A graduate student in good academic standing is making adequate progress toward the completion of degree requirements both in terms of time and quality of work. Students in good standing will maintain a cumulative grade point average of 3.0 (B) or better in their coursework (with at least six credit hours attempted). Individual graduate programs may adopt stricter requirements for good academic standing, which need to be formally approved and included in their section of the University Graduate Catalog.

Graduate students should periodically discuss their academic progress with their advisors to learn whether they are performing satisfactorily and making sufficient progress toward the degree.

Probation & Dismissal Process

If a graduate student is deemed not to be in good academic standing in a given term or half term, the graduate program will decide to place the student on academic probation in the following term or half term for at least the duration of that entire term or require the student to withdraw from the University. Graduate programs will notify students in writing when their performance falls below acceptable levels. Students should be notified of their probationary status ahead of the add/drop deadline of the subsequent semester, otherwise they will be granted an additional full semester of probation.

During the probationary status, the student will not be awarded a graduate degree or certificate or be advanced to candidacy. For students on probation, individual graduate programs may also create policies requiring students to achieve minimum grades in the overall program of study and/or in particular courses, provided such stipulations are applied fairly, transparently, and consistently among the graduate student population in the program. A longer probationary period may be granted at the discretion of the program. Whenever an extended probationary period is granted, a list of clear expectations and milestones shall be shared with the student in writing, and progress shall be tracked.

A student on probation when last enrolled in a graduate program who wishes to be readmitted to that program, or change programs, or degree level, must submit a petition along with the Request for readmission form or application to a new program. The petition should provide reasons for the poor academic record, explain how conditions that produced the poor performance have changed, and present specific plans for improvement. The admitting graduate program reviews the documents and makes a determination on admission/readmission as well as any conditions of academic probation.

A student whose cumulative GPA falls below a B (3.0 on a 4.0 point scale), or who is not making satisfactory progress toward the degree, may be denied permission to register, required to withdraw from the term, or be dismissed from the program. Immediate dismissal without a probationary period should only be used in the most extreme situations, where student success support efforts are highly unlikely to succeed. The decision to dismiss a student without a probationary period should be reviewed by the college academic standards committee or an equivalent committee. Programs must provide the student with written notification of the grounds for dismissal.

See also Time to Degree policy and Regulations of Student Conduct.

Accelerated Masters Programs

An accelerated graduate degree creates an opportunity for exceptional undergraduate students to obtain both their undergraduate and graduate degrees by completing some undergraduate course requirements at the graduate level leading to a substantial savings in time and money. The graduate credit hours that satisfy undergraduate degree requirements also reduce the credit hours needed for the graduate degree and are typically referred to as double counting or credit sharing. Accelerated programs that rely on double counting to reduce time-to-degree are often referred to as “4+1 accelerated masters”.

Double counting

The maximum number of graduate level credits that can be counted toward an undergraduate degree program is 15 credit hours in an accelerated program. Accelerated program proposals must specify which courses in the graduate curriculum can be double counted with the undergraduate requirements and how they fit into the undergraduate program of study. Typically, graduate programs designate graduate courses with similar subject-matter to undergraduate degree requirements (i.e. requiring accelerated students to take the 500 level course of a 400 level undergraduate requirement). Graduate level double counted courses are delivered at a higher level of rigor and should not be taken until students are officially admitted into the accelerated program.

Admission

Undergraduate students can be considered for admission into an accelerated master’s program after they have earned 60 credit hours, typically in the junior year. If admitted, their graduate program will be their secondary curriculum in the student information system. Given the condensed nature of the program, a higher GPA is expected for admission. Individual programs can set their own admission requirements to ensure student success in the accelerated program.

Student Status (U/G)

Accelerated students remain classified as continuing undergraduate students until they complete their undergraduate degree requirements and apply for and are granted their bachelor’s degree. In addition, they will not be classified as new graduate students or be factored into a
graduate cohort for retention calculation purposes. They will only come in as continuing graduate students for headcount.

Financial Aid eligibility

Accelerated students taking graduate courses to complete the requirements of their undergraduate degree are eligible for financial aid as undergraduate students. When 4+1 students obtain their undergraduate degree and their graduate program changes from secondary to primary curriculum, they are viewed as graduate students for financial aid purposes (i.e. domestic students are restricted to only loans). To maximize their financial aid benefits, students should be advised not to proceed with additional graduate courses before they complete the approved double-counted graduate courses along with all other undergraduate degree requirements.

Tuition

Undergraduate students electing Graduate course(s) will be assessed the graduate tuition rate for the graduate course(s). Graduate courses are numbered 500 and above. Graduate students electing Undergraduate course(s) will be assessed the Undergraduate Tuition rate. Undergraduate courses are numbered 499 and below.

Graduation timing

Accelerated students can apply for each degree credential as soon as the respective degree requirements have been completed. Students who are unable to complete their graduate degree, are still eligible to complete the requirements of the undergraduate degree and apply for their bachelor’s degree.

Minimum grade requirements

Students must meet the minimum grade requirements of their graduate program and respective accelerated option.

Exempting, Waiving, and Repeating Courses

Exempting, Waiving, and Repeating Courses

The following policies on course waivers, exemptions, and repeats apply only to the University of Michigan-Dearborn master's programs.

Some University of Michigan Dearborn master’s programs permit course waivers and/or exemptions. Wherever permitted, course waivers or exemptions are initiated and approved by program faculty. A course may be waived – thereby reducing the number of credit hours required for the degree – in cases when students have taken courses similar in content to courses in a graduate program. A course exception, on the other hand, does not reduce the total number of credit hours needed to satisfy program requirements, and thus requires the replacement of the exempted course with another approved course.

Course waivers/exemptions are approved for academic study of a subject; they are not approved for experiential background in the subject area.

Course Waivers

It is recognized that some students may have taken courses that are similar in content to courses in a graduate program. Under these circumstances, with academic unit approval, a course requirement may be waived. Course waivers reduce the number of credits required for the degree. It is important to note that all masters students will still need to accumulate a minimum of 30 credits in order to earn the degree. Many master’s programs require more than 30 credit hours. To qualify for a waiver, typically, the course should have similar content as the course required for the University of Michigan-Dearborn program. Students should consult their academic unit for their specific policies; not all graduate programs permit waivers.

Course Exemptions

On occasion, a course in a graduate program may not be available, may no longer be offered due to program changes, or the student may have taken a course with equivalent content. In these instances, and for other similar reasons, programs may consider granting a course exemption. The determination of courses suitable for exemption rests with the academic unit.

To qualify for an exemption, the course should be similar in content to a course required for the University of Michigan-Dearborn graduate program. An approved course exemption does not reduce the total number of credit hours needed to satisfy program requirements. Programs must require an approved course to replace an exempted course. Students should consult their academic unit for their specific policies and process; not all graduate programs permit course exemptions.

Repeating Courses

Graduate students, with the permission of the program advisor, may repeat a course. Grades and honor points for the original course and the repeated course(s) will appear on the student's transcript and be used in computing the student's grade point average; however, additional credit toward program will not be awarded for the repeated course.

Graduate Certificate Policy

A graduate certificate is a non-degree credential, less extensive than a Master's program, which is designed to provide students with a specialized set of courses that supplement a primary field of study, area of expertise, or provide an interdisciplinary experience within a defined body of knowledge. Certificates are encouraged in areas not currently addressed by a graduate degree program and where they might provide added benefits to students beyond existing degree programs. This policy pertains to non-Rackham University of Michigan Dearborn programs. Rackham graduate degree programs must follow Rackham rules, found on their website (http://www.rackham.umich.edu/).

Certificates can be created within specific disciplines or departments, college-wide programs, or across departmental/college boundaries with the issuing college having the responsibility for administering/monitoring the certificate program.

- University of Michigan-Dearborn graduate certificates contain a required minimum of nine (9) credit hours. Individual graduate programs may opt for a higher credit hour requirement depending on the particular set of skills on which their certificates focus.
- Only graduate level courses may be used to meet certificate requirements.
- Students admitted to certificate programs must complete requirements within three (3) years from the date of first enrollment.
in the program, with only one possible one-year extension allowed for unusual individual circumstances.

- Upon completion of the graduate certificate requirements, the student will receive a certificate issued by the University of Michigan-Dearborn. Graduate certificate recipients will not participate in commencement ceremonies.

There are two (2) types of graduate certificate programs offered at the University of Michigan-Dearborn:

1) Linked certificates are connected to specific graduate degree programs and offered to students enrolled in a degree program. Students pursuing such a certificate must be formally admitted to the certificate program and must be enrolled in a degree-granting program at UM-Dearborn.

2) Stand-alone certificates comprise a distinct set of courses not wholly aligned with an existing degree program and are offered to non-degree students. Students interested in these certificates should apply directly through standard graduate non-degree seeking admissions procedures.

All graduate certificate applicants are required to meet the following minimum requirements for admission:

- Completion of a bachelor's degree from a U.S. college or university accredited by a regional accrediting association, or completion of an international degree that is equivalent to a U.S. bachelor's degree from a college or university recognized and approved by the Ministry of Education or Commission responsible for higher education in the country where the degree is earned.

- Applicants whose native language is not English must demonstrate English proficiency according to the admission requirements of the relevant graduate program.

All University of Michigan-Dearborn certificate programs should follow the below criteria:

- Students may transfer from another accredited institution into a University of Michigan-Dearborn certificate program up to half of the credit hours required by the certificate, but no more than six (6) credit hours of graduate credit. If a certificate requires 9 credits of coursework, only 3 credits can be double-counted. Applicable credit hours from other institutions can be transferred only if they have not been applied to another degree or certificate and if they were earned with a grade of B or better within five (5) years prior to enrollment.

- There is no limit to the number of credit hours earned at the University of Michigan-Dearborn that can be applied to a graduate certificate program.

- Students who have taken the requisite courses for a given certificate, but have not applied for admission into the certificate program, can petition to obtain the certificate as long as they are currently enrolled in a graduate degree program at the University of Michigan Dearborn.

- To obtain a certificate, the student must have a minimum cumulative grade point average of B (3.0 on a 4.0 point scale) with a minimum of C (2.0 on a 4.0 point scale) in any course in the certificate program coursework.

- All graduate credits earned in a certificate program at the University of Michigan Dearborn can be applied toward a University of Michigan-Dearborn graduate degree program, however, a more restrictive policy is at the discretion of each graduate program. For Dual degree programs, if either program prohibits double counting, the prohibition applies to the other program as well.

**Graduate Dual Degrees**

Dual degree programs allow a student to combine two graduate programs of study in complementary programs via intentionally designed curricular coursework which allow for some double-counting of credits. Students completing dual degree programs successfully will be granted two separate diplomas and will include both degrees on the transcript.

Dual degree programs can be student-initiated, or school-defined. School-defined programs are subject to the regular degree program review process. The review process for student-initiated degree programs is described below.

**Student-Initiated Dual Degree Programs**

A student may seek approval for an individualized graduate dual degree program. Graduate students must complete at least one term of coursework in good academic standing before requesting to be considered for admission to a dual degree program. A dual degree program can combine at most two single degree programs. Student-initiated dual degree programs are reviewed on an individual basis and must be approved by the colleges of each degree. To provide consistent application of curriculum requirements and policy as well as to ensure the degree audit requirements are met, all proposals for dual degrees must be submitted to the UCDC Graduate Subcommittee.

Students may request dual degree programs in the following combinations:

- a doctoral degree in one field of specialization and a master's degree in another field;
- two master's programs.

This graduate dual degree policy does not cover graduate certificates and how their coursework can be counted toward a degree (see Graduate Certificate Policy).

**Double-Counting Credit Hours for Dual Degree Programs**

Students in dual degree programs may ask to double-count a limited number of credits toward the requirements of both degrees. All dual-degree programs are subject to the following general rules:

- Double-counted courses must meet the requirements of both programs.
- Courses can be double-counted only if they were taken less than five years before the start of enrollment in the current degree program.
- At least half of the minimum required credits for each degree must be earned in the program and counted solely for that degree. For example, a student enrolled in a 36-hour master's program may not apply more than a combination of 18 transfer and/or double-counted credits toward the degree requirements.
- A program may overlap with only one other program for the purpose of double-counting credits. Credits may never be used for three or more programs. If a student seeks a third degree, it must stand alone.
- Programs may limit credit double-counting below the maximum number allowed in this policy, but may not allow credit double-counting above this limit. Some programs may not allow credit double-counting.
- For a doctoral student who wishes to use some credits toward a master's in another program, no course numbered 990, 995, or with
Graduate Guest/Non-Candidate for Degree

Guest Students

Students currently enrolled in a graduate degree-seeking program at another university may request permission to enroll in graduate courses at the University of Michigan-Dearborn as a guest student. Master's level students are permitted to enroll for a maximum of 6 semester hours of credit and doctoral level students are permitted to enroll for a maximum of 9 semester hours of credit as a guest student at UM-Dearborn. University of Michigan-Ann Arbor and University of Michigan-Flint students, while still considered guests, are not held to the above credit cap. However, these University of Michigan system students should follow relevant transfer of credit policies. Guest students register on a space-available basis.

Please note that the University of Michigan-Dearborn participates in the Michigan Intercollegiate Graduate Studies (MIGS) program. If the courses you are interested in taking are not available at your home institution, you should consider applying through the MIGS option.

Non-Candidate For Degree (NCFD)

NCFD status enables qualified individuals not in a degree-seeking program to take a maximum of 6 credit hours for graduate credit. NCFD students register on a space-available basis. Courses elected by students under this status cannot be counted toward a degree program until the student receives regular degree-seeking admission and the graduate program advisor determines that the courses are acceptable. Please note: the College of Business on the University of Michigan-Dearborn campus does not offer enrollment under NCFD status.

All guest and NCFD students are:

- Subject to all UM-Dearborn admission and registration regulations.
- Admitted for one term only. Additional registration under this status requires a new application each term.

- Assessed regular UM-Dearborn graduate tuition and related fees for all courses elected.
- Not eligible for financial aid.
- Responsible for determining if credit earned as a guest/NCFD student will be accepted by their degree-seeking program of interest if applicable.

All guest/non-candidate for degree applicants must provide the following documentation for admission consideration:

- A completed guest/NCFD application form.
- Official transcripts from the student's undergraduate degree-granting institution and when applicable, from all other higher education institutions where graduate courses were completed or are in progress.
- For guest applicants only: Written permission from the student's home institution verifying enrollment in a graduate program and granting permission to elect the course(s) at the University of Michigan–Dearborn is required.

Non-Candidate for degree applicants should be aware of the following:

- Admission as a graduate non-candidate for degree student does not guarantee or imply admission or eligibility for a graduate degree-seeking program at the University of Michigan-Dearborn. To be considered for transition to a degree-seeking program, a completed graduate degree-seeking application and required supplemental materials must be submitted.
- In order for courses taken as a graduate non-candidate for degree student to be considered as credit towards a graduate degree program, relevant applicable credit evaluation or transfer credit policies should be followed. Advance communication with your program of interest is encouraged.

Graduate Program Completion Requirements

Graduation/Application for Diploma

Each candidate for a degree must file a Degree/Diploma Application with the Office of Registration & Records, typically within ten days of the beginning date of classes for the term in which the student expects to complete the requirements for degree. Please consult the Applying to Graduate Webpage, umdearborn.edu/rr_apply-graduate (http://www.umdearborn.edu/rr_apply-graduate/), for specific dates. Applications will not be accepted after the published deadlines. If an application for a diploma was filed for a previous graduation period in which the student did not graduate, a new application is necessary. Degrees are granted at the end of the fall, winter, and summer terms, even though commencement exercises are held only in April (or May) and December.

Research, Thesis, and Dissertations

Formatting Requirements/Dissertation Embargo Policy

Dissertation guidelines vary by discipline. Be sure to follow the correct guideline as outlined on the Office of Graduate Studies web site (https://umdearborn.edu/academics/graduate-studies/office-graduate-studies/doctoral-dissertations/?
Transfer Credit Policy

The following policy represents a campus-wide baseline standard for transferring credit at University of Michigan Dearborn graduate programs. Individual colleges or programs may adopt more restrictive requirements. Rackham programs at the University of Michigan Dearborn campus are required to follow the academic policies of the Rackham Graduate School.

With program adviser approval, select graduate coursework credits earned at another accredited institution may be transferred toward a University of Michigan-Dearborn graduate degree. It is the responsibility of the student requesting transfer of credit to submit to the graduate program adviser an official transcript with course final grade, a copy of the catalog with course description from the former institution, and a course syllabus.

Students eligible to transfer credit must:

• be enrolled in good standing in their graduate degree program;
• have satisfied all conditions for full or conditional admission.

Criteria for transferring credit for master’s programs:

1. Coursework must have been completed within five years of the term of admission into the graduate program where credit is being transferred.
2. Students may transfer credits for graduate-level courses taken while pursuing an undergraduate degree only if these were not used to fulfill requirements for a degree or certification from another institution and only if there is confirmation that these courses required graduate-level work.
3. For master’s level programs, graduate credit may be transferred from other accredited degree-granting universities with graduate degree programs for up to a maximum of 6 credit hours, or their equivalent. For universities on the quarter system, 9 credit hours is the equivalent of 6 semester credit hours. Graduate credit may be transferred from other University of Michigan campuses (Flint or Ann Arbor) for up to half the credits required for the degree.

For doctoral and other post-master’s programs, students should refer to program-specific information and requirements.

Credits may not be transferred:

• If they are used or will be used, in whole or in part, to fulfill requirements for a bachelor’s or other degree
• If they are applied to a certificate from another institution;
• for courses taken at an exclusively undergraduate institution or community college;
• for courses taken more than five years before admission to the student’s current program; or
• for courses for which a letter grade of less than “B” has been awarded. Note: Courses graded pass/fail or satisfactory/unsatisfactory are not eligible to be transferred.

Under no circumstance will credit used in one master’s degree program be transferred to satisfy the requirements of another master’s degree. If the program advisor determines that coursework completed in a previous master’s degree is equivalent to University of Michigan-Dearborn courses,
NON-ACADEMIC POLICIES


Faculty & Staff Policies and Procedures (https://umdearborn.edu/about/policies-and-procedures/faculty-staff-policies-and-procedures/)

General University Policies and Procedures (https://umdearborn.edu/about/policies-and-procedures/general-university-policies-and-procedures/)

Information Technology Policies, Procedures and Standards (https://umdearborn.edu/about/policies-and-procedures/information-technology-policies-procedures-and-standards/)

Instruction & Research Services Policies and Procedures (https://umdearborn.edu/about/policies-and-procedures/instruction-research-services-policies-and-procedures/)

Student Affairs Policies and Procedures (https://umdearborn.edu/about/policies-and-procedures/student-affairs-policies-and-procedures/)
ARCHIVES


2015-2016 Graduate Catalog (PDF (http://catalog.umd.umich.edu/archives/GR_2015-2016.pdf))

2015-2016 Undergraduate Catalog (PDF (http://catalog.umd.umich.edu/archives/UG_2015-2016.pdf))


2010-2012 Graduate Catalog (PDF (http://catalog.umd.umich.edu/archives/GR_2010-2012.pdf))


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