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 (General Education)

All students must satisfy the University's Dearborn Discovery Core requirements (http://catalog.umd.umich.edu/undergraduate/gen_ed_ddc/), in addition to the requirements for the major. Students must also complete all CASL Degree Requirements. (http://catalog.umd.umich.edu/undergraduate/college-arts-sciences-letters/)

Prerequisites to the Major

Not counted in the minimum 46 credit hours required for the major.

Code	Title	Credit Hours
BIOL 130	Intro Org and Environ Biology	4
BIOL 140	Intro Molec & Cellular Biology	4
CHEM 134	General Chemistry IA	4
CHEM 136	General Chemistry IIA	4
CHEM 225	Organic Chemistry I	4
CHEM 226	Organic Chemistry II	4
PSYC 101	Introduction to Psychology	3
Total Credit Hours		**27**

Major Requirements

Minimum 46 credits hours required depending on selection of courses.

Code	Title	Credit Hours
BIOCHEMISTRY		**4**
BCHM 370	Principles of Biochemistry	
GENETICS/CELL BIOLOGY		**4**
Select one of the following:		
BIOL 301	Cell Biology [2]	
BIOL 306	General Genetics [3]	
BIOL 474	Molecular Biology [4]	
NEUROSCIENCE		**6**
Select one of the following courses:		
BIOL 350	Principles of Neurobiology and Neuroendocrinology	
PSYC 400	Cognitive Neuroscience [1]	
Select one of the following laboratory courses:		
BIOL 355	Integrative Neurobiology, Physiology and Endocrinology Lab	
BBS 400	Cognitive Neuroscience Laboratory [1]	
BIOLOGY, EVOLUTION AND ANIMAL BEHAVIOR		**4**
Select one of the following:		
ANTH 331	Biological Anthropology and Human Evolution	
ANTH 409	The Developmental Origins of Health and Disease	
ANTH 430	Medical Anthropology	
BIOL 303	Comparative Animal Physiology	
BIOL 360	Population Genetics & Evolution	
BIOL 419	Behavior and Evolution	
BIOL 424	Integrative and Comparative Zoology	
BIOL 456	Behavioral Ecology [3]	
PSYC 372	Animal Behavior	
PHYSIOLOGICAL PSYCHOLOGY		**3-4**
Select one of the following:		
BIOL 357	Human Physiology	
PSYC 370	Physiological Psychology	
ADDITIONAL LABORATORY		**2**
Select one of the following:		
BBS 400	Cognitive Neuroscience Laboratory [1]	
BIOL 302	Cell Biology and Cellular Physiology laboratory [2]	
BIOL 355	Integrative Neurobiology, Physiology and Endocrinology Lab	
BIOL 457	Behavioral Ecology Lab [3]	
BIOL 475	Molecular Biology Laboratory [4]	
COGNITION		**8**
Select two of the following:		
PSYC 363	Cognitive Psychology	
PSYC 375	Psychology of Language	
PSYC 400	Cognitive Neuroscience	
PSYC 461	Learning and Memory	
PSYC 463	Sensation and Perception	
PSYC 464	Applied Cognitive Psychology	
PSYC 474	Animal Learning and Cognition	
EPIDEMIOLOGY/HEALTH PSYCHOLOGY		**3-4**
Select one of the following:		
ANTH 415	Nutrition and Health	

BIOL 380	Epidemiology	
HHS 412	Principles of Epidemiology	
PSYC 455	Health Psychology	
STATISTICS		**4**
Select one of the following:		
PSYC 381	Prin of Stat and Exper Design	
STAT 301	Biostatistics I	
EXPERIMENTAL PSYCHOLOGY		**4**
PSYC 465	Experimental Psychology	
CAPSTONE		**4**
Select one of the following:		
BBS 490	Behavioral and Biological Sciences Capstone	
BIOL/BBS 402	Physiology of Excitable Cells	
BIOL 460	Sequence Analysis and Bioinformatics	
BIOL 480	Neurobiology of Brain Disorders	
Total Credit Hours		**46-48**

[1] PSYC 400 and BBS 400 may be taken concurrently.
[2] BIOL 301 and BIOL 302 may be taken concurrently.
[3] BIOL 456 and BIOL 457 may be taken concurrently.
[4] BIOL 474 and BIOL 475 may be taken concurrently.

NOTE: At least 20 of the 46 credit hours for the major must be elected at UM-Dearborn.

Recommended Electives:

ANTH 415 Nutrition and Health , BIOL 304 Ecology , BIOL 410 Diversity, Equity and Inclusion in Health Care: Research and Treatment , HHS 435 Obesity and the Lifecourse , PSYC 300 Life-Span Developmental Psych , PSYC 320 Social Psychology , PSYC 440 Abnormal Psychology , PSYC 442 Child Psychopathology , PSYC 446 Human Sexual Behavior , PSYC 470 Advanced Physiological Psych , PSYC 473 Clinical Neuropsychology , PSYC 474 Animal Learning and Cognition

Honors Designation in Behavioral and Biological Sciences

In order to be considered for Honors designation, a student must complete and submit an honors application (attached) to the BBS Program committee Director via his/her/their advisor no later than the end of the term prior to graduation.

Honors in BBS will be earned by meeting all of the following criteria:

- cumulative GPA of 3.5 or higher in BBS major 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 (BBS 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 BBS program (broadly defined) focus.
- 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.
- Presentation of the research thesis before a committee of three faculty: the thesis advisor, two full time Faculty from the BBS program committee or one BBS faculty member and one external member of the student's choosing. The defense should be held a minimum of 2 weeks prior to the final-exams week of the semester in which the student is graduating. The committee must be provided with a draft of the thesis one week prior to the defense **OR** 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).

Learning Goals

1. Explain how molecular and genetic processes contribute to behavior.
2. Explain how environmental and socio-cognitive experiences contribute to behavior.
3. Describe the causes orpossible causes of behaviora ldisease or illness, and provide scientific rationale for the pharmacological and socio-cognitive treatment of illness and disease.
4. Read, interpret, and critique the literature in biology and behavioral science. a) Communicate in written and spoken formats about scientific principles and findings. b) Interpret and design appropriate experiments and apply principles of data analysis using statistical methods.
5. Understand professional and ethical responsibilities.