COLLEGE OF ENGINEERING & 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 16 master degrees and 5 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, 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 programs in automotive systems, bioengineering, computer and information science, data science, energy systems, industrial systems, information systems and technology, human-centered design, electrical, computer, mechanical, robotics, manufacturing systems engineering, software, program and project management, as well as engineering management, 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.

At the present time, the size of the student body, together with the breadth and depth of the instructional programs to be given, require that specific course offerings be spaced appropriately throughout the three-term year on which UM-Dearborn operates. The present schedule of courses in the four engineering disciplines and CIS provides opportunity for both full-time and part-time students.

Students who wish to pursue engineering and computer science programs on a full-time basis may enter in fall, winter, or summer terms. The usual full load program of graduate studies varies from none to 12 credit hours each term. For mechanical, electrical and computer, industrial and systems, manufacturing systems, or automotive systems engineering, qualified students entering in the fall for continuous study can plan to complete their studies in one year. Normally they will complete an average of 24 credit hours in the first two terms, and can satisfy the remaining credit hours of the minimum 30-hour requirement on a part-time basis through courses that span the complete spring-summer term, or in some cases on a full-time basis during the spring half-term. Students in the engineering management program must complete 36 credit hours. Students in the automotive systems engineering program must undertake a capstone project or a master’s thesis, which will span two terms. Full-time students should be able to complete their automotive systems engineering degree program in four terms.

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.

Students may also pursue an alternative type of participation (similar in timing to a cooperative program but without University control over the work periods) when continuous participation is not feasible for financial or other reasons.

This degree program is available both on campus and via the Internet.

Ph.D. Programs

Our Ph.D. programs are administered and taught by tenured faculty with industry-linked research. In CECS we bring together theory and real-world experiences to develop innovative solutions to solve the challenges of today’s ever-changing society.

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 (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/automotive-systems-engineering)
- Bioengineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/bioengineering)
- Computer Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/computer-engineering)
- Computer and Information Science (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/computer-information-science)
- Data Science (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/Course%20Descriptions)
• Electrical Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/electrical-engineering)
• Energy Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/energy-systems-engineering)
• Engineering Management (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/engineering-management)
• Human-Centered Design and Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/human-centered-design-engineering)
• Industrial and Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/industrial-systems-engineering)
• Information Systems and Technology (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/information-systems-technology/#masterext)
• Manufacturing Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/manufacturing-systems-engineering)
• Mechanical Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/mechanical-engineering)
• Program and Project Management (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/program-project-management)
• Robotics Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/robotics-engineering)
• Software Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/software-engineering)

Doctorate Programs
• Automotive Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/automotive-systems-engineering/#doctorateext)
• Computer and Information Science (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/computer-information-science)
• Electrical, Electronics, and Computer Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/electrical-electronic-engineering)
• Industrial and Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/industrial-systems-engineering)
• Mechanical Sciences and Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/mechanical-sciences-engineering)

Dual Degree Programs
• Industrial and Systems Engineering (MSE) and Master of Business Administration (MBA) (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/industrial-systems-engineering/#dualdegreeext)

Certificates
• Automotive Materials and Design (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/automotive-materials-design)
• Automotive Noise, Vibration & Harshness (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/automotive-nvh)
• Automotive Powertrains (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/automotive-powertrains)
• Control Systems (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/control-systems)
• Electric Energy Technology (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/electric-energy-technology)
• Game Design (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/game-design)
• Intelligent Systems in Engineering Applications (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/intelligent-systems-engineering-applications)
• Plastic & Composite Materials (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/plastic-composite-materials)
• Program & Project Management (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/program-project-management/#certificatext)
• Software Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/software-engineering/#certificatext)
• Systems Engineering (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/systems-engineering)
• Vehicle Electronics & Controls (http://catalog.umd.umich.edu/graduate/college-engineering-computer-science/vehicle-electronics-controls)

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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:

Distance Learning Network (DLN)
Most CECS graduate courses are available via distance learning, making it possible to complete an entire degree or certificate program online. Most courses do require examination proctoring, either at the UMD campus or utilizing a proctor at an alternate location. Presently, all DLN 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 distance learning students can view recorded lectures at their convenience. Distance learning students have opportunities to interact with their instructors and with other students throughout the semester. A shared course website increases opportunities for broader interaction, intellectual exchanges, and networking.

Graduate Certificate Programs
The college’s Graduate Certificate Programs are designed to provide specialization in a particular topic area. Each certificate requires the completion of a minimum of twelve graduate credit hours. Certificate courses provide students with the opportunity to complement an already acquired degree, or transfer some credits into one of the college’s graduate degree programs (upon admission) as dictated by University policy. Many certificate program courses are available via distance learning.

Technical Seminars and Short Courses (Non Credit Topics)
ELO’s technical seminars and short courses are designed for engineering and computer science professionals wishing to explore particular areas of interest without committing to semester-long credit courses. All offerings are designed and taught by UM-Dearborn faculty or industry experts. Courses are offered in online or face-to-face formats (on campus or at corporate locations). Continuing Education Units (CEU’s) or Professional Development Hours (PDH’s) are awarded to participants successfully completing course requirements. With sufficient interest, courses may also be customized to meet organizational training needs.

For Further Information
To request additional information about any of the ELO programs mentioned here, please contact the department at 313-593-4000 or visit umdearborn.edu/cecs/extended-learning-outreach.