MECHANICAL ENGINEERING, M.S.

The department offers a master of science (M.S.) and doctor of philosophy (Ph.D.) in mechanical engineering. The graduate programs are designed to train outstanding students for advanced work in industry and research and development through a combination of coursework and hands on research. Online programs in the department include an M.S. with named option in controls and a master of engineering (M.Eng.) with named option in polymer science.

The Department of Mechanical Engineering has a long history of excellence in graduate education. The department is consistently ranked in the top 20 in the United States for graduate programs in mechanical engineering. The department offers research opportunities in a large number of established and emerging research specializations. Broad research themes within the department include: biomechanics, computational engineering, energy, manufacturing, and mechanics and controls. Excellent research facilities are available for specialized research within these broad areas for studies in: biomechanics, combustion, computational design, controls, cryogenics, dynamics and vibrations, fluid dynamics, fluid power, geometric modeling and prototyping, heat and mass transfer, internal combustion engines, laser diagnostics, manufacturing processes, mechanics, mechatronics, polymer and composites processing, powertrain control, robotics, solar energy, and more.

A list of mechanical engineering faculty and their respective areas of specialization is available on the department’s website (http://directory.engr.wisc.edu/me/faculty).


ONLINE PROGRAMS

The mechanical engineering M.Eng. named option: polymer science is a fully online degree that includes an interdisciplinary curriculum of courses incorporating the latest research and practices in plastics and polymer manufacturing. It is designed to prepare engineers for professional practice in the polymer industry. Please visit the Department of Engineering Professional Development’s website (https://epd.wisc.edu/online-degree/master-of-engineering-polymer-science) for complete information about the online polymer science program.

The mechanical engineering M.S. named option: controls is a primarily online degree that includes a full curriculum of courses incorporating the latest research and practices in drive, converter control, and sensor integration. This program consists of 27 online credits and 3 credits taken on campus through a summer laboratory course. The program includes courses in both mechanical engineering and electrical engineering and is designed for practicing engineers. Please visit the Department of Engineering Professional Development’s website (http://epd.wisc.edu/online-degree/mechanical-engineering-controls) for complete information about the online controls program.

REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS AND SATISFACTORY PROGRESS

To make progress toward a graduate degree, students must meet the Graduate School Minimum Degree Requirements and Satisfactory Progress (http://guide.wisc.edu/graduate/#policiesandrequirementstext) in addition to the requirements of the program.

MASTER’S DEGREES

M.S., with available named option in Controls

M.Eng., with available named option in Polymer Science

MINIMUM GRADUATE DEGREE CREDIT REQUIREMENT

30 credits

MINIMUM GRADUATE RESIDENCE CREDIT REQUIREMENT

M.S. 18 credits, M. Eng. 16 credits

MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT

Half of degree coursework (15 out of 30 total credits) must be in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS

M.S. With program approval, students are allowed to count graduate coursework from other institutions (up to 50% of the formal course requirement) toward the minimum graduate degree credit requirement and the minimum graduate coursework (50%) requirement. No credits from other institutions can be counted toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

M. Eng.: no transfer credits are allowed.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE

M.S.: Up to 7 credits numbered 400 or above may be counted toward the minimum graduate degree credit requirement. These credits may be counted toward the minimum graduate coursework (50%) requirement if they are in courses numbered 700 or above. No credits may be counted toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

M.Eng.: With advisor approval, students are allowed to count no more than 7 credits of graduate level coursework from their undergraduate career at UW–Madison. These credits may be counted toward the minimum graduate coursework (50%) requirement if they are in courses numbered 700 or above. No credits can be counted toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.
PRIOR COURSEWORK REQUIREMENTS: UW-MADISON UNIVERSITY SPECIAL

With program approval, students are allowed to count up to 15 credits of coursework numbered 300 or above taken as a UW–Madison Special student toward the minimum graduate residence credit requirement and the minimum graduate degree credit requirement. These credits may be counted toward the minimum graduate coursework (50%) requirement if they are in courses numbered 700 or above. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

CREDITS PER TERM ALLOWED
15 credits

PROGRAM-SPECIFIC COURSES REQUIRED
M.S.: Two semesters of M E 903 Graduate Seminar are required. These should be taken the first two semesters the student is in residence.

M. Eng.– named option Polymer Science: See program-specific information on the program website (https://epd.wisc.edu/online-degree/master-of-engineering-polymer-science/#/about).

OVERALL GRADUATE GPA REQUIREMENT
M.S. 3.00 GPA required.

OTHER GRADE REQUIREMENTS
Students must earn a C or above in all formal coursework.

PROBATION POLICY
The status of a student can be one of three options:

1. Good standing (progressing according to standards; any funding guarantee remains in place).
2. Probation (not progressing according to standards but permitted to enroll; loss of funding guarantee; specific plan with dates and deadlines in place to remove probationary status).
3. Unsatisfactory progress (not progressing according to standards; not permitted to enroll, dismissal from program, leave of absence or change of advisor or program).

ADVISOR / COMMITTEE
All students are required to obtain a mechanical engineering faculty advisor who assists them in planning a course sequence that meets degree requirements and who will discuss career objectives with the students.

An M.S. thesis committee must include student's mechanical engineering faculty advisor and at least two other faculty members.

ASSESSMENTS AND EXAMINATIONS
The thesis track requires that the student pass a formal thesis defense.

TIME CONSTRAINTS
Master’s degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

ADMISSIONS

Students with a strong background in mechanical engineering or a related field with interest in furthering their education in mechanical engineering are encouraged to apply for admission to the department. Applicants accepted into the program generally have an undergraduate grade point average well above the graduate school minimum of 3.0 on a 4.0 scale. All applicants are required to take the Graduate Record Exam (GRE). Applications are evaluated on the basis of previous academic record, GRE scores, letters of recommendation, and a personal statement. For more information on admission requirements see the department website (https://www.engr.wisc.edu/admissions/graduate-admissions).

LEARNING OUTCOMES

KNOWLEDGE AND SKILLS
• demonstrate a strong understanding of mathematical, scientific, and engineering principles in the field.
• demonstrate an ability to formulate, analyze, and solve advanced engineering problems.
• demonstrate creative, independent problem solving skills.
• apply the latest scientific and technological advancements, advanced techniques, and modern engineering tools to these problems.

PROFESSIONAL CONDUCT
• recognize and apply principles of ethical and professional conduct.

PEOPLE

Faculty: Professors Engelstad, Ghandhi (chair), Lorenz, Moskwa, Nellis, Osswald, Pfotenhauer, Rowlands, Rutland, Sanders, Shapiro, Thelen, Turng; Associate Professors Krupenkin, Negrut, Pfefferkorn, Ploeg, Qian, Rothamer, Shedd, Suresh, Trujillo, Zinn; Assistant Professors Adamczyk, Eriten, Henak, Kokjohn, Miller, Min, Roldan-Alzate, Rudolph; Faculty affiliates Allen, Bonazza, Clemons, Corradini, Holloway, Kammer, Luzzio, Reindl, Scarlat, Schauer, Smith