Mechanical Engineering, B.S.E.

Educational Objectives

Within a few years of graduation, graduates of the mechanical engineering program will:

- have successful careers in engineering and beyond and will have assumed professional roles of increasing responsibility and impact;
- have acquired new knowledge and expertise through professional development opportunities or advanced education; and
- be engaged in workplace, professional, or civic communities.

Graduates of the Department in Mechanical Engineering B.S.E. program will be prepared to effectively contribute as engineers in a diverse and multidisciplinary work environment. They will have an ability to:

- identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
- apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors;
- communicate effectively with a range of audiences;
- recognize ethical and professional responsibilities in engineering situations and make informed judgments which consider the impact of engineering solutions in global, economic, environmental, and societal contexts;
- function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
- develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and
- acquire and apply new knowledge as needed, using appropriate learning strategies.

Requirements

The Bachelor of Science in Engineering requires a minimum of 128 s.h. of credit. Students must have a g.p.a. of at least 2.00 on all college work used to satisfy degree requirements as well as on all work undertaken at the University of Iowa.

The major in mechanical engineering lays a foundation in the basic disciplines of mathematics, physics, and chemistry and in the engineering sciences of statics, dynamics, thermodynamics, mechanics of deformable bodies, mechanics of fluids and transfer processes, materials science, and electrical sciences. An understanding of these sciences enables mechanical engineers to design parts of systems and understand whole systems, plan the production and use of energy, plan and operate industrial manufacturing facilities, and design automatic control systems for machines and other mechanical systems.

Mechanical engineering students develop an awareness of social and humanistic issues relating to business, environment, government, history, language, religion, and international relations. They also acquire an appreciation of professional and ethical responsibilities.

All engineering students complete the B.S.E. core requirements, which include RHET:1030 Rhetoric, ENGR:1100 Introduction to Engineering Problem Solving, ENGR:1300 Introduction to Engineering Computing, and courses in chemistry, engineering mathematics and fundamentals, and physics.

They also complete the curriculum designed for their major program, which covers four major stems: mathematics and basic sciences, engineering topics, a focus area, and the General Education Component (GEC). For information about the curriculum stems, see the Bachelor of Science in Engineering, B.S.E. in the Catalog.

Upper-level students work on team projects in a senior capstone design course, ME:4086 Mechanical Engineering Design Project. Some students may arrange to participate in established research projects.

Students must select focus area elective courses according to guidelines established by the Department of Mechanical Engineering. See “Focus Area” below.

Focus Area

The mechanical engineering program offers a variety of focus area options, including standard focus areas developed and maintained by the program and flexible focus areas tailored to individual student interests.

Mechanical engineering students can select a focus area from the following.

- Energy and Environment
- Manufacturing
- Mechanical Engineering Design
- Robotics and Autonomous Systems
- Tailored

For a list of standard mechanical engineering focus area options and guidelines for tailored focus areas, see the undergraduate Mechanical Engineering Program page on the Department of Mechanical Engineering website.

Combined Programs

B.S.E./M.S. in Mechanical Engineering

A Bachelor of Science/Master of Science combined degree program is available for qualified University of Iowa undergraduate students. This allows students to complete a M.S. degree in two or three semesters after completion of their B.S.E. degree. Those in the combined degree program receive a B.S.E. degree when all requirements have been completed, and then become M.S. students in the Department of Mechanical Engineering (ME).

The Undergrad to Grad (U2G) combined degree program is primarily intended for students interested in pursuing the M.S. nonthesis degree option. However, the M.S. degree thesis option can be pursued in instances where students have been conducting research under the supervision of a ME faculty member since, at least, the summer following their junior year, and a ME faculty member is willing to advise them and serve as committee chair for their final exam.
Interested students should discuss the combined degree program with their advisor during their third year. Applications should be submitted during the second semester of their third year and before the start of their fourth year (two-semester blended model); see the U2G Program on the Department of Mechanical Engineering website. However, single-semester admits are allowed and must adhere to the application deadlines and other program requirements.

Accepted students are expected to have a minimum University of Iowa cumulative g.p.a. of at least of 3.25, and maintain this grade-point average throughout their time in the program. Undergraduate students whose UI cumulative grade-point average falls below this minimum are removed from the combined program.

Students may contact any ME faculty member to inquire about participation in the U2G combined degree program, research opportunities, and financial support.

**Program Benefits**

Students may apply up to 12 s.h. of graduate-level coursework toward both their B.S.E. and M.S. degrees. However, credit may not be applied to courses taken prior to admission to the combined degree program. Mechanical engineering courses eligible for graduate credit are numbered ME:4100 or above, except for ME:4186 Enhanced Design Experience. The courses selected must fulfill M.S. coursework requirements and be applicable to B.S.E. electives.

Students who select the thesis option can begin work on their M.S. thesis research with a faculty advisor during their fourth year of undergraduate studies.

Graduate Record Examination (GRE) General Test scores are not required for admission to the combined degree program. Students are assessed undergraduate tuition and fees until their B.S.E. degree has been conferred; then, students are assessed graduate tuition and fees, and they may be eligible for graduate assistantships.

**Financial Support**

Departmental funding preference is given to Ph.D. students. Students can discuss financial support possibilities with their advisor.

**Career Advancement**

Engineering is a well-respected profession that is used as a foundation for a variety of careers in industry, medicine, law, government, and consulting. Engineering majors consistently claim several of the top ten spots on the list of top-paid majors for bachelor’s degree graduates, according to the National Association of Colleges and Employers (NACE). On average, 93-98 percent of graduates are employed in their field of study or pursuing advanced education within seven months of graduation.

Engineering Career Services develops and promotes experiential education and professional opportunities for students in the College of Engineering. Professional staff coordinate the college’s co-op and internship program, engage in employer outreach, and provide opportunities for students to network with employers, including an engineering career fair each semester and other programming related to career development.

Engineering Career Services also offers individual advising and class presentations on résumé and cover letter preparation, job and internship search strategies, interviewing skills, and job offer evaluation.