

# DEPARTMENT OF MECHANICAL ENGINEERING

Eric Wolbrecht, Chair (324I Engineering/Physics Bldg. 83844-0902; phone: 208-885-0348; [www.uidaho.edu/engr/ME](http://www.uidaho.edu/engr/ME) (<http://www.uidaho.edu/engr/ME/>)).

Mechanical engineering applies the principles of science and technology to create products and systems that benefit mankind in several areas:

1. the conversion of energy from natural sources to provide power, light, heating and cooling, and transportation;
2. the design and production of machines to improve and lighten the burden of human work;
3. the creative planning, design, development, and operation of systems for utilizing energy, machines, and other resources;
4. the production of manufactured goods; and
5. the interface between technology and society.

Mechanical engineering is broad in scope and provides a wide range of careers for trained professionals in industry, business, government, and universities. Positions are available in design, testing, manufacturing, research, development, operations, system analysis, marketing, and administration. Mechanical engineers are often involved as professional team members in economic and social-humanistic matters and are responsible for the interaction of technical advances with social and environmental concerns.

## Mission Statement

Our mission is to prepare students for entry into professional engineering practice and advanced study through our regionally-recognized program of high-quality instruction, integrated design and laboratory experience, and scholarship.

## Program Educational Objectives

A few years after graduation, a University of Idaho mechanical engineering practitioner is expected to

1. attain career advancement based on demonstrated knowledge and skill in areas such as engineering analysis, programming, modeling/simulation, experimental methods, application of regulatory compliance, design for manufacturability, and integration of interdisciplinary information;
2. achieve client and stakeholder satisfaction of engineering solutions emphasizing advanced design and analysis methodologies leading to technically informative prototypes and quality products while considering real-world constraints;
3. use effective multimodal communication to develop engineering solutions and clearly convey meaning to intended audiences using a broad range of communication methods;
4. seek lifelong personal and professional development through pursuits such as networking, entrepreneurship, graduate degrees, professional licenses, certifications, career advancement, and exploratory endeavors; and
5. collaborate with diverse individuals while considering public and worker safety, environmental impacts, and ethical and legal practices, to develop sustainable solutions for communities and society at large.

## Mechanical Engineering Student Outcomes

Upon graduation, students will have the ability to

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

## Undergraduate Program

Successful completion of the approved curriculum results in the award of the Bachelor of Science (B.S.M.E.) in Mechanical Engineering. Our program educational objectives are based on the needs of our constituencies. We focus on the professional and personal development of our students and continuously assess and improve our undergraduate curriculum. Our department is a college and university leader in the use of innovative teaching methods, vertical curriculum integration, and applied design projects. Students interact frequently and personally with the faculty and are mentored and advised by them. The strengths of our program are a solid engineering science foundation (as demonstrated by the outstanding performance of our graduates on the nationwide Fundamentals of Engineering Exam, a required precursor to becoming a licensed professional engineer); a strong design experience featuring the design and construction of several projects; and laboratory experience featuring hands-on skills, state-of-the-art instrumentation, broad exposure to instrumentation and principles, and a senior project. These strengths also include multiple teamwork experiences, including the opportunity to lead and to serve in team roles; the substantial use of appropriate engineering tools, including the best available software; and multiple communication experiences, including written and oral presentations.

The Mechanical Engineering undergraduate program is accredited by the Engineering Accreditation Commission of ABET (<https://www.abet.org/>) under the General Criteria and the Program Criteria for Mechanical and Similarly Named Engineering Programs.

General questions regarding the undergraduate program should be addressed to the advising coordinator by phone at 208-885-5024 or by email at [medept@uidaho.edu](mailto:medept@uidaho.edu). Faculty members are available to discuss details of their specialty areas with interested students.

An academic Minor in Mechanical Engineering is available. Contact the department for more information.

## Graduate Program

The following graduate degrees are available in mechanical engineering: Master of Engineering (M.Engr.), Master of Science (M.S.), and the

Doctor of Philosophy (Ph.D.). Minimum preparation for graduate study in mechanical engineering is a B.S. in a mechanical engineering program that is accredited by ABET. Students entering the program with an engineering or physical science baccalaureate degree in a major other than mechanical engineering must demonstrate proficiency in the subjects required in the B.S.M.E. program. Individual student qualifications are assessed by the departmental graduate committee, which also determines undergraduate deficiencies.

The programs of study are designed to extend the student's understanding of the fundamental engineering sciences and their application to engineering systems design and analysis. Research programs are offered with specialization in many general topics; please see the departmental website for faculty research areas. We maintain and continuously improve the graduate curriculum. Graduate students receive quality mentoring and advising.

Graduate students will develop a plan of study in consultation with their academic advisor that provides for a reasonable concentration in a particular field of interest and a selection of related courses, some of which may be taught outside of the department. For M.S. and Ph.D. students, the research topic will generally be selected by members of the departmental faculty. Candidates for the M.Engr. degree will deliver a presentation and short report for a project designated by their major professor.

We support education throughout the state of Idaho and beyond by providing quality distance education through the University of Idaho's Engineering Outreach program as well as supporting, collaborating, and including our faculty at the Boise and Idaho Falls campuses of the University.

## Service

We provide engineering services (teaching, consulting, outreach, testing, and research) to support industry and national laboratories. In addition, we provide service to professional societies, the college and university, and the region. We encourage our graduates to support the improvement of our program in formal and informal ways. These include student referrals, periodic evaluation, and donations of time, equipment, and money.

## Material Requirements

Mechanical Engineering students are required to have a Windows-based laptop for use in coursework. Minimum and recommended specifications are provided here: UI ME Computer Requirements ([https://www.uidaho.edu/-/media/uidaho-responsive/files/engr/academic-programs/me/engr-me-computer-requirement\\_20210510.pdf?la=en&rev=e0ec07ccd7ec49fb9929c2f83c4d6b3f](https://www.uidaho.edu/-/media/uidaho-responsive/files/engr/academic-programs/me/engr-me-computer-requirement_20210510.pdf?la=en&rev=e0ec07ccd7ec49fb9929c2f83c4d6b3f)). Student laptops should meet these requirements by the start of their 2<sup>nd</sup> year when computer performance is necessary for completion of coursework.

Limited software support is available through the Office of Information Technology (<https://www.uidaho.edu/oit/>) (OIT). Hardware support is the responsibility of the student.

## Majors

- Mechanical Engineering (B.S.M.E.) (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/mechanical-engineering-bsme/>)

## Minors

- Mechanical Engineering Minor (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/mechanical-engineering-minor/>)

## Certificates

- Aerospace Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/aerospace-undergraduate-academic-certificate/>)
- Computer-Aided Engineering Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/computer-aided-engineering-undergraduate-academic-certificate/>)
- Material Behavior and Performance Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/material-behavior-performance-undergraduate-academic-certificate/>)
- Mechanical Design and Manufacturing Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/mechanical-design-and-manufacturing-undergraduate-academic-certificate/>)
- Robotics Engineering Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/robotics-engineering-undergraduate-academic-certificate/>)
- Thermal Energy System Design and Analysis Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/thermal-energy-system-design-analysis-undergraduate-academic-certificate/>)

## Mechanical Engineering Graduate Program

Candidates must fulfill the requirements of the College of Graduate Studies and of the Department of Mechanical Engineering. Applicants for admission generally will have a B.S. degree in mechanical engineering. Those students admitted with degrees in other engineering fields will be expected to complete any undergraduate deficiencies. See the College of Graduate Studies (<https://catalog.uidaho.edu/colleges-related-units/graduate-studies/>) section for the general requirements applicable to each degree.

- Mechanical Engineering (M.Engr.) (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/mechanical-engineering-mengr/>)
- Mechanical Engineering (M.S.) (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/mechanical-engineering-ms/>)
- Mechanical Engineering (Ph.D.) (<https://catalog.uidaho.edu/colleges-related-units/engineering/mechanical-engineering/mechanical-engineering-phd/>)