

MECHANICAL ENGINEERING

Faculty: Professors: Fakheri, Nair, Ryu; Associate Professors: Henderson, Kim, Reyer (Interim Chair), Timpe; Assistant Professors: Amofo-Yeboah, Rudy; Emeritus Professors Abou-Hanna, Hurt, Johnson, Mehta, Okamura, Wessler, Zietlow; Emeritus Associate Professors: Deller, Podlasek.

The department offers an undergraduate degree program in Mechanical Engineering (BS-ME) (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-major/>) and has four undergraduate ME concentrations in Biomedical (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-biomedical-concentration/>), Chemical Engineering (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-chemical-engineering-concentration/>), Energy (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-energy-concentration/>), and Robotics/Autonomous Vehicles (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-robotics-autonomous-vehicles-concentration/>). See the Graduate Catalog (<https://catalog.bradley.edu/graduate/engineering-technology/mechanical-engineering/>) for information about our MS-ME graduate program.

Mission and Objectives

The mission of the Mechanical Engineering Department is to produce mechanical engineering graduates who possess the acumen, competence, and skills needed to enter, succeed, and lead in professional practice and/or graduate school. The goal is to provide a learning and nurturing environment that stimulates faculty and students to collaborate in solving practical problems, motivates lifelong learning, and helps them reach their highest potential.

The program educational objectives of the department are that alumni meet the following goals within a few years of graduation from the mechanical engineering program:

1. Are in professional practice or are pursuing advanced studies in mechanical engineering or related fields.
2. Are using their educational foundation to engage in lifelong learning
3. Are engaged and adding value in multidisciplinary environments through local, regional, national or international practice to meet global technological and societal changing needs.

Student Outcomes

In order to meet these program educational objectives, students graduating from Bradley's mechanical engineering program will attain the following outcomes.

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to 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
3. an ability to communicate effectively with a range of audiences
4. an ability to 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. an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Mechanical engineering is the broadest and most versatile of the engineering professions. Mechanical engineers are particularly concerned with the application of science and technology to translate ideas and theories into realistic engineering solutions that satisfy the needs of society, by using a combination of human, material, and economic resources. The broad discipline of mechanical engineering can be organized into two main branches, namely mechanical systems and thermal systems.

- Within mechanical systems, the following specialties may be pursued: applied mechanics, dynamic and control systems including robotics, materials, nanotechnology, and micro-electromechanical systems (MEMS).
- Within thermal systems, the following specialties may be pursued: energy systems, including aerospace, diesel and gasoline engine power, gas turbines, and solar energy, fluid dynamics, heat transfer, and air pollution control.
- Spanning both branches are the following specialties: bioengineering and computer and microprocessor applications

The undergraduate program also offers a broad technical background for persons wishing to enter graduate programs in different areas of mechanical engineering, business, law and medicine.

The faculty believes that engineers must be firmly grounded in the fundamentals of their field and the supporting areas of mathematics, communication, and the sciences, so that graduates will be able to adapt quickly to the rapid changes occurring in our technological society. Therefore, the curriculum has been designed to stress the basic tools of knowledge and practice essential to launch one's professional career and a lifelong process of continued learning.

The spectrum of mechanical engineering includes innovation and creation, research, design and synthesis, analysis, development, evaluation, production, and the marketing of machines, systems, and processes. Central to this activity is the design process which leads to the creation of solutions to real-world problems. Therefore, the mechanical engineering curriculum integrates design experiences into all levels of the program and into a majority of the technical electives. This culminates in a required comprehensive experience which is satisfied by a yearlong senior project and by the selection of technical.