

MECHANICAL ENGINEERING - ENERGY CONCENTRATION

Department: Mechanical Engineering (<https://catalog.bradley.edu/undergraduate/engineering-technology/mechanical-engineering/>)

The baccalaureate program in mechanical engineering is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org> (<https://www.abet.org/>).

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

Energy is the lifeblood of industrial economies and is essential for economic growth. Today, some of the biggest engineering challenges are related to the production and efficient use of limited energy resources.

This concentration prepares students to identify and analyze strategies to produce energy and to use energy resources in more economically efficient and environmentally responsible ways.

In emerging industrial economies, the demand for new energy sources is growing at a faster rate than in more mature industrial economies. This has stimulated the demand for engineers and creative solutions. Energy production resources are often not located in areas of the world with high energy demand, thus energy production and use have huge geopolitical implications. Accordingly, engineers must be aware of the robust set of relevant governmental rules and regulations.

Students selecting the Energy Concentration within Mechanical Engineering (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-major/>) can select courses from a broad array of fundamental and applied courses related to solar energy, energy management, renewable energy, nuclear energy, electrical power plant design, energy conservation, and energy production. The energy concentration will require no additional hours over the basic mechanical engineering degree for graduation.

The Energy Concentration follows the complete Mechanical Engineering curriculum but with restrictions to the topics of the technical electives:

Code	Title	Hours
Approved Energy Concentration Technical Electives		
Energy Electives (choose four):		12.0
M E 407	Power Plant Design	
M E 409	Mechanical Engineering Projects	
M E 491	Special Topics in Mechanical Engineering	
M E 501	Advanced Thermodynamics	
M E 503	Internal Combustion Engines	
M E 507		
M E 509	Solar Engineering	
M E 515	Intermediate Heat Transfer	
M E 520	Gas Dynamics	
M E 521	Intermediate Fluid Mechanics	
M E 533	Propulsion Systems	
M E 534	Environmental Engineering-Air Conditioning	
M E 535	Environmental Engineering-Refrigeration	
M E 536	Industrial Pollution Prevention	
M E 537	Building Energy Management	
M E 591	Topics in Mechanical Engineering (depending on the topic)	
Select one Technical Elective. See list of Approved Technical Electives Courses ¹		3.0
Total Hours		15

¹ Approved Technical Electives courses may be found here (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-major/>).