

MECHANICAL ENGINEERING - BIOMEDICAL 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

Biomedical Engineering integrates physical, chemical, mathematical, and computational sciences and engineering principles to study biology, medicine, behavior, and health. It advances fundamental concepts,

creates knowledge from the molecular to the organ-system level, and develops innovative biologics, materials, processes, implants, devices and informatics approaches for the prevention, diagnosis, and treatment of disease, for patient rehabilitation, and for improving health. For engineering students who would like to have education in this expanding field, the Mechanical Engineering Department offers a Biomedical Engineering concentration that is embedded within the traditional Mechanical Engineering program (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-major/>). This concentration will require an additional one credit hour for graduation.

The Biomedical Engineering concentration requires the complete Mechanical Engineering major curriculum (<https://catalog.bradley.edu/undergraduate/programs/mechanical-engineering-major/>) with the following exceptions:

Code	Title	Hours
Approved Biomedical Concentration Technical Electives		
BIO 230	Human Anatomy and Physiology I (Lecture)	3.0
BIO 231	Human Anatomy and Physiology Laboratory I	1.0
M E 280	Introduction Biomedical Engineering	3.0
Select two of the following approved mechanical engineering biomedical electives:		6.0
M E 580	Biomechanics	
M E 582		
M E 588	Human Centered Design	
Select an approved mechanical engineering technical elective ¹		3.0
Total Hours		16

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

The biomedical concentration program advisors may recommend that students take some of these courses earlier in their degree program than the last year. Students will work closely with their advisor in choosing the proper time and order for their coursework.