

Minor in Biomedical Engineering

The purpose of the **Biomedical Engineering (BME)** minor is to more strongly attract and serve engineering undergraduate students who are seriously interested in biomedical engineering careers. The minor will provide substantial exposure to biomedical engineering concepts and applications, and provide a stronger credential for students seeking jobs in the biomedical field. It will also better prepare students to be more effective in careers in the field, and will help better prepare students who are seeking graduate studies in biomedical engineering.

The general goals and objectives for the BME Minor are:

1. Provide students with exposure and experiences with the application of engineering principles, physics, chemistry, physiology, and modern biology to BME applications;
2. Train students to apply basic sciences and engineering principles to biological problems;
3. Train students to apply research/design to relevant BME problems.

In order to declare a minor in Biomedical Engineering, students must have been admitted to the School of Engineering and to the major of their choice. Students must declare the BME minor by completing a declaration of minor form and are strongly encouraged to do so as early as possible. This will allow the best opportunity for advising to minimize the number of courses/credits required beyond the major degree requirements.

The BME minor requires a minimum of 18 credit hours. Students must complete the courses required with a cumulative GPA of 2.0 or better. All Biomedical Engineering minor courses must be taken for a letter grade; neither S/U nor credit/no credit is permitted. Students who complete the BME minor are not eligible for the Bioengineering Undergraduate Certificate.

BME core course:

Code	Title	Hours
C&PE 656	Introduction to Biomedical Engineering	3

BME technical elective courses: Two (2) courses are required from the following list (min 6 cr).

Code	Title	Hours
BINF 701	Computational Biology I (cannot count with EECS 730)	5
BINF 702	Computational Biology II	5
C&PE 226	Fundamentals of Biomedical and Biomolecular Engineering	3
C&PE 657	Polymer Science and Technology	3
C&PE 676	Principles of Biomolecular Engineering	3
C&PE 686	Bioprocess Engineering	3
C&PE 715	Topics in Chemical and Petroleum Engineering: _____ (Drug Delivery)	3
C&PE 751	Basic Rheology	3
C&PE 752	Tissue Engineering	3
CE 573	Biological Principles of Environmental Engineering	3
or CE 773	Biological Principles of Environmental Engineering	

EECS 730	Introduction to Bioinformatics (cannot count with BINF 701)	3
ME 633	Basic Biomechanics	3
ME 750	Biomechanics of Human Motion	3
ME 751	Experimental Methods in Biomechanics	3
ME 753	Bone Biomechanics	3
ME 754	Medical Imaging	3
ME 755	Computer Simulation in Biomechanics	3
ME 757	Biomechanical Systems	3
ME 758	Physiological System Dynamics	3
ME 760	Biomedical Product Development	3
ME 765	Biomaterials	3
ME 767	Molecular Biomimetics	3
ME 790	Special Topics: _____ (Biomedical Microdevices)	3
ME 790	Special Topics: _____ (Bioadditive Manufacturing)	1-5

BME research/design experience: Choose from the following list (min 3 cr).

Code	Title	Hours
AE 592	Special Projects in Aerospace Engineering for Undergraduate Students (Biomedical Project)	3
ARCE 490	Special Problems (Biomedical Project)	1-3
or ARCE 491	Honors Research	
CE 490	Special Problems (Biomedical Project)	3
C&PE 651	Undergraduate Problems (Biomedical Project)	3
or C&PE 661	Undergraduate Honors Research	
EECS 399	Projects (Biomedical Project)	3
or EECS 498	Honors Research	
EECS 502	Senior Design Laboratory II (Biomedical Project)	3
EECS 542	Computer Systems Design Laboratory II (Biomedical Project)	3
EECS 582	Computer Science and Interdisciplinary Computing Capstone (Biomedical Project)	3
EPHX 501	Honors Research (Biomedical Project)	3
or EPHX 503	Undergraduate Research	
ME 360	Mechanical Engineering Problems (Biomedical Project)	1-3
or ME 361	Undergraduate Honors Research	
ME 640 & ME 643	Design Project and Design Project Option C (Biomedical Project)	4
Summer Research Experience for Undergraduates (REU) participation (a minimum of 8 weeks, full-time, in-person) will also fulfill this requirement.		

Biomedical Projects all require review and approval for biomedical content/emphasis, except for ME 640 & ME 643.

Biomedical Sciences Core: One of the following courses (3 cr).

Code	Title	Hours
BIOL 240	Fundamentals of Human Anatomy	3
BIOL 246	Principles of Human Physiology	3
BIOL 546	Mammalian Physiology	3

Biomedical Sciences Elective: Either Biomedical Sciences Core course above not used to fulfill the Biomedical Sciences Core or one of the following courses (min 3 cr).

Code	Title	Hours
BIOL 150	Principles of Molecular and Cellular Biology	3
or BIOL 151	Principles of Molecular and Cellular Biology, Honors	
BIOL 152	Principles of Organismal Biology	3
BIOL 400	Fundamentals of Microbiology	3
or BIOL 401	Fundamentals of Microbiology, Honors	
BIOL 416	Cell Structure and Function	3
BIOL 435	Introduction to Neurobiology	3
BIOL 503	Immunology	3
BIOL 506	Bacterial Infectious Diseases	3
BIOL 512	General Virology	3
C&PE/PHCH 725	Cellular and Molecular Pharmaceutics	3
BIOL 600	Introductory Biochemistry, Lectures	3