

BIOENGINEERING MINOR

Banner Code: BIOE

The minor in Bioengineering is available to both engineering and non-engineering majors. It provides considerable opportunities in a highly cross-disciplinary field involving the application of engineering concepts and tools to solve problems in biomedicine. The minor in Bioengineering prepares students to gain and reinforce their knowledge of biology and engineering fundamentals, and develop and apply skills to clinically-relevant challenges.

Admissions & Policies

Admissions

Students must have completed MATH 114 (Calculus II) with a grade of B- or better to be admitted to the minor.

Policies

For policies governing all minors, see AP.5.3.4 Minors.

Requirements

Total credits: 19-21

Minor Requirements

Required Courses:

Code	Title	Credits
BENG 101	Introduction to Bioengineering	3
BIOL 213	Cell Structure and Function (Mason Core)	4
BENG 313	Physiology for Engineers	3
Total Credits		10

Technical Electives:

Code	Title	Credits
Select at least nine credits from the following list:		9-11
Computational Modeling and Biomechanics		
BENG 304	Modeling and Control of Physiological Systems	
BENG 406	Introduction to Biomechanics	
BENG 420	Bioinformatics for Engineers	
Biomedical Imaging & Devices		
BENG 301 & BENG 302	Bioengineering Measurements and Bioengineering Measurements Lab	
BENG 437	Medical Image Processing	
Nanomedicine & Biomaterials		
BENG 421	Introduction to Tissue Engineering	
BENG 441	Nanotechnology in Health	
Neuroengineering		
BENG 327	Cellular, Neurophysiological, and Pharmacological Neuroscience	
Neuroscience		
BENG 429	Mason-Inova Applied Technologies	
Study Abroad		

BENG 417	Bioengineering World Health Research Experience
BENG 395	RS: Mentored Research in Bioengineering (Research Experience)
Students may choose to substitute two of the technical electives (up to 6 credits) from the following:	
ECE courses	
ECE 370	Robot Design
ECE 410	Applications of Discrete-Time Signal Processing
ECE 422	Digital Control Systems
ECE 431	Digital Circuit Design
ECE 470	Introduction to Humanoid Robotics
ME courses	
ME 221	Thermodynamics
ME 322	Fluid Mechanics
ME 313	Material Science
ME 432	Control Engineering
SYST courses	
OR 442	Stochastic Operations Research
SYST 468	Applied Predictive Analytics
SYST 470	Human Factors Engineering
NEUR courses	
NEUR 327	Cellular, Neurophysiological, and Pharmacological Neuroscience
NEUR 461	Special Topics in Neuroscience
BIOL courses	
BIOL 311	General Genetics
BIOL 385	Biotechnology and Genetic Engineering
BIOL 484	Eukaryotic Cell Biology
BIOL 486	Molecular Biology and Biotechnology Laboratory
CHEM courses	
CHEM 313	Organic Chemistry I
CHEM 314	Organic Chemistry II
CHEM 463	General Biochemistry I
Total Credits	9-11