BIOENGINEERING MINOR

Banner Code: BIOE

Website: https://bioengineering.gmu.edu/

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 Analytic Geometry and 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) [1]	4
BENG 214	Physiology for Engineers	3
Total Credits		10

[1] All students in the Bioengineering minor program are recommended to register for the specific section of BIOL 213 Cell Structure and Function (Mason Core).

Technical Electives:

Code	Title	Credits
Select at least nine credits from the following list:		9-11
Computational Biomedicine		
BENG 420	Biomedical Data Analytics	
BENG 430	Continuum Biomechanics and Biotransport II	
BENG 435	Multi-scale Modeling and Simulation in Biomedicine	
Biomedical Imaging & Devices		
BENG 437	Medical Image Processing	
BENG 438	Advanced Biomedical Imaging	
BENG 470	Bioinstrumentation and Devices II	
Biomaterials & Nanomedicine		
BENG 413	Molecular Engineering Laboratory	
BENG 421	Cell and Tissue Engineering	
BENG 441	Nanomedicine and Drug Delivery	
Neurotechnology & Computational Neuroscience		
BENG 327	Cellular, Neurophysiological, and Pharmacological Neuroscience	
BENG 426	Neural Engineering	
BENG 434	Computational Modelling of Neurons and Networks	
BENG 487	Neuroinformatics	
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	Cell Signaling and Disease	
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