

# BIOMEDICAL ENGINEERING - MINOR

## Program Requirements

Code	Title	Semester Credit Hours
BMEN 253	Discovering Biomedical Engineering Design Thinking	1
VIBS 243	Introductory Mammalian Histology	2
Select 12 hours from one area: <sup>1</sup>		12
<b>Biomechanics Area</b>		
Required courses:		
BMEN 343	Biomedical Engineering Materials	
BMEN 361	Biomedical Engineering Mechanics	
Select two of the following:		
BMEN 432	Molecular and Cellular Biomechanics	
BMEN 457	Orthopedic Biomechanics	
BMEN 458	Motion Biomechanics	
BMEN 461	Cardiac Mechanics	
BMEN 463	Soft Tissue Mechanics and Finite Element Methods	
MEEN 363	Dynamics and Vibrations	
MEEN 368	Solid Mechanics in Mechanical Design	
<b>Cellular and Molecular Bioengineering</b>		
Required courses:		
BMEN 344	Biological Interactions and Testing	
BMEN 431	Biomolecular Engineering	
Select two of the following:		
BMEN 432	Molecular and Cellular Biomechanics	
BMEN 480	Biomedical Engineering of Tissues	
BMEN 486	Biomedical Nanotechnology	
BMEN 487	Drug Delivery	
ECEN 414	Biosensors	
<b>Computational Bioengineering</b>		
Required courses:		
BMEN 321	Circuits, Signals, and Systems	
BMEN 401	Principles and Analysis of Biological Control Systems	
Select two of the following:		
BMEN 463	Soft Tissue Mechanics and Finite Element Methods	
BMEN 471	Numerical Methods in Biomedical Engineering	
MEEN 442	Computer Aided Engineering	
MEEN 444	Finite Element Analysis in Mechanical Engineering	
<b>Imaging and Photonics</b>		
Required courses:		
BMEN 311	Imaging Living Systems	

BMEN 321	Circuits, Signals, and Systems
Select two of the following:	
BMEN 402	Biomedical Optics Laboratory
BMEN 420	Medical Imaging
BMEN 422	Bioelectromagnetism
BMEN 425	Biophotonics
BMEN 427	Magnetic Resonance Engineering
ECEN 411	Introduction to Magnetic Resonance Imaging and Magnetic Resonance Spectroscopy
ECEN 412	Ultrasound Imaging
ECEN 447	Digital Image Processing
ECEN 463	Magnetic Resonance Engineering
<b>Medical Devices</b>	
Required courses:	
BMEN 404	FDA Good Laboratory and Clinical Practices
BMEN 406	Medical Device Path to Market
Select two of the following:	
BMEN 469	Entrepreneurial Pathways in Medical Devices
MEEN 440	Bio-inspired Engineering Design
MEEN 441	Design of Mechanical Components and Systems
MEEN 442	Computer Aided Engineering
<b>Regenerative Medicine</b>	
Required courses:	
BMEN 343	Biomedical Engineering Materials
BMEN 344	Biological Interactions and Testing
Select two of the following:	
BMEN 480	Biomedical Engineering of Tissues
BMEN 482	Polymeric Biomaterials
BMEN 483	Polymeric Biomaterial Synthesis
BMEN 486	Biomedical Nanotechnology
CHEN 451	Introduction to Polymer Engineering
MEEN 458	Processing and Characterization of Polymers
MSEN 410	Materials Processing
MSEN 420	Polymer Science
<b>Sensing and Monitoring</b>	
Required courses:	
BMEN 321	Circuits, Signals, and Systems
BMEN 322	Biosignal Analysis
Select two of the following:	
BMEN 401	Principles and Analysis of Biological Control Systems
BMEN 428/	Embedded Systems for Medical Applications
CSCE 461	Applications
BMEN 448	Healthcare Technology in the Developing World
ECEN 414	Biosensors

**Total Semester Credit Hours**

**15**

<sup>1</sup> Students must select courses exclusively from one of the seven areas represented and not mixed.

Students must be admitted to a degree sequence in the College of Engineering or to the degree sequence in Biological and Agricultural Engineering. Students should know that all tracks require completion of math through Differential Equations (MATH 308). Students may use no more than 6 hours from their home department to satisfy minor requirements. All substitutions must be approved by the BMEN academic advisor and director. Applications are available in the Biomedical Engineering Advising Office and will be reviewed on a competitive basis at the end of every fall and spring semester.