

BIOMEDICAL ENGINEERING - MINOR

The Department of Biomedical Engineering offers a minor to students within the College of Engineering who are interested in biomedical applications of engineering related to the sub-specialty fields of biomechanics, cellular and molecular bioengineering, computational bioengineering, imaging and photonics, medical devices, regenerative medicine, or sensing and monitoring. Students interested in the Biomedical Engineering minor can visit the Biomedical Engineering Minor website (<https://engineering.tamu.edu/biomedical/academics/degrees/undergraduate/minor.html>).

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: ¹		12
Biomechanics Area		
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	
Cellular and Molecular Bioengineering		
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	
Computational Bioengineering		
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

Imaging and Photonics

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

Medical Devices

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

Regenerative Medicine

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

Sensing and Monitoring

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 CSCE 461 Applications	
BMEN 448 Healthcare Technology in the Developing World	
ECEN 414 Biosensors	
Total Semester Credit Hours	15

¹ 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.