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/ CSCE 461	Embedded Systems for Medical 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.