College of Engineering
Department of Biomedical Engineering and Mechanics
Minor in Biomedical Engineering
For students entering under UG catalog 2022-2023

To obtain a minor in Biomedical Engineering (BME) students must first be accepted into the BME minor program. Once accepted, a student must take 6 hours of required coursework, 6 hours of approved elective courses, and 6 hours of approved BME research for a total of 18 credits. For successful completion of the minor, students must maintain a 3.0 in-minor GPA with a minimum grade of C- or better in all courses that the student counts toward the minor. No pass/fail courses will be accepted.

Required Courses:

1.	BMES	2104	Introduction to Biomedical Engineering (PRE: ENGE 1216 OR 1414, MATH 2214)	3
2.	BMES/BMVS	4064	Introduction to Medical Physiology	3

Approved BME Research: Students may pursue one or a combination of the following options in order to fulfill the requirement: 6

- Senior design courses (BSE 4125/6, ESM 4015/6, ISE 4005/6, ME 4015/6, MINE 4535/6, MSE 4075/6)
- Departmental undergraduate research course (BMES 4994, BMES 4994H, BMVS 4994, BSE 4994, CEE 4994, CHE 4994, CS 4994, ECE 4994, ESM 4994, ISE 4994, ME 4994, MSE 4994, MINE 4994, OE/AOE 4994)

Approved Electives: 6

Choose 2 courses from the following list. Note, the courses offered as electives may have hidden prerequisites. It is the responsibility of the student to assure that all prerequisites are met prior to registration for these courses.

Total credits: **18**

Statement of Prerequisites: Prerequisites for each required course are listed after the course title. The (letter grade) notation, such as (C-) indicates the minimum grade students must earn in the pre-requisite course. Prerequisites may change from what is indicated. Be sure to consult the University Catalog or check with your advisor for the most current prerequisites. Prerequisites for elective courses are not listed on this checksheet and it is the responsibility of the student to assure that all prerequisites are met prior to registration for these courses.

APPROVED
University Registrar

Below listed elective courses have pre- and/or co-requisites, be sure to consult the University Catalog or check with your advisor. *With the exception of courses listed with a credit hour reference in parentheses, technical electives are 3 credit hour courses.*

BME MINOR APPROVED ELECTIVES	
Course Number	***Name***
BMES 3124	Introduction to Biomechanics
BMES 3134	Introduction to Biomedical Imaging
BMES 3144	Biomedical Devices
BMES 3154	Bioinstrumentation and Analysis
BMES 3844 / NEUR 3844	Computational Neuroscience and Neural Engineering
BMES 4134	Global, Societal, and Ethical Considerations in Biomedical Engineering
BMES 4154	Commercialization of BME Research
BMES 4614	Probability-Based Modeling, Analysis, and Assessment
BSE/CHE 4544	Protein Separation Engineering
BSE 4564	Metabolic Engineering
CHE 4104	Process Materials
†CHE 5214/BMES 5434	Polymeric Biomaterials
CHE 4304/ME 4344	Biological Transport Phenomena
CS 4784	Human Computer Interaction
CS 4884	Computational Biology and Bioinformatics
ECE 4580	Digital Image Processing
ECE 4624	DSP and Filter Design
†ECE 5605/BMES 5525	Stochastic Signals and Systems
†ECE 5606/BMES 5526	Stochastic Signals and Systems II
ESM 4105	Engineering Analysis of Physiologic Systems I
ESM 4106	Engineering Analysis of Physiologic Systems II
ESM 4204	Musculoskeletal Biomechanics
ESM 4224	Biodynamics and Controls
ESM 4234 / BMES 4234	Mechanics of Biological Materials and Structures
ESM 4245	Mechanics of Animal Locomotion
ESM 4246	Mechanics of Animal Locomotion
ESM 4304	Hemodynamics
†ESM 5405/5406	Biomed Engr Intern
ISE 4624	Work Physiology
†ISE 5154	Applied Human Factors Engineering
†ISE 5614/BMES 5214	Human Physical Capabilities
†ISE 5644	Auditory Display Design
ME 4864/5864G	Micro/Nanorobotics
†ME 5764/BMES 5764/ESM 5764	Modeling MEMS and NEMS
MSE 4574	Biomaterials
MSE 4584	Biomimetic Materials
MSE 4614	Nanomaterials
†BMES/BMVS 5024	Biomedical Engineering and Human Disease

†BMES/BSE/CHE 5044	Engineering Mathematics
†BMES 5054	Quantitative Cell Physiology
†BMES 5064	Quantitative Organ Systems Physiology
†BMES 5124 /ESM 5224	Advanced Musculoskeletal Biomechanics
†BMES 5164	Advanced Impact Biomechanics
†BMES/ME 5174	Biomechanics of Crash Injury Prevention
†BMES 5184	Injury Physiology
†BMES 5204	Laboratory Techniques in Injury Prevention **(4)**
†BMES/ISE 5214	Human Physical Capabilities
†BMES 5304G	Advanced Biological Transport Phenomena
†BMES/ESM 5305	Biomechanics of Cardiovascular System
†BMES/ESM 5306	Biomechanics of Cardiovascular System
†BMES 5314	Introduction to Regenerative Medicine
†BMES/CHE 5434	Polymeric Biomaterials
†BMES/ME 5514	Digital Signal Processing for Mechanical Measurements
†BMES/ECE 5525	Stochastic Signals and Systems
†BMES 5534	Advanced Computational Methods and Modeling for Biomedical Applications
†BMES 5574	Advanced Biomaterials
†BMES 5614	Multi-Scale Cancer Engineering
†BMES 5714	Biomedical Microdevices
†BMES 5724	Biomedical Nanoengineering
†BMES 5764	Modeling MEMS and NEMS

† Students in their senior year, with 3.0 or better GPA, may enroll in 5000-level courses satisfying undergraduate degree requirements within their department with the permission of the course instructor.