College of Engineering
School of Biomedical Engineering and Sciences
Minor in Biomedical Engineering
Students Graduating in Calendar Year 2020

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, PHYS 2305, Co: 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 both 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

BME MINOR APPROVED ELECTIVES

Course Number	Name	Pre-req
BMES 3124	Introduction to Biomechanics	BMES 2104, ESM 2204, ESM 2304
BMES 3134	Introduction to Biomedical Imaging	BMES 2104, (MATH 2204 or MATH 2204H), PHYS 2306
BMES 3144	Biomedical Devices	BMES 2104
BMES 3184	Problem Solving in BME	BMES 2104
BMES 4134	Global, Societal, and Ethical Considerations in Biomedical Engineering	
BMES 4154	Commercialization of BME Research	BMES 2104, 3024
BSE 3534	Bioprocess Engineering	BSE 3504, BIOL 2604, CHEM 2535 or CHEM 2565/H, (CHEM 3615/H or CHEM 4615)
BSE 4544/CHE 4544	Protein Separation Engineering	BSE 3504 or CHE 3144
BSE 4564	Metabolic Engineering	BSE 3534
CHE 4104	Process Materials	CHE 2164, CHEM 2535 or 2565
CHE 5214/BMES 5434	Polymeric Biomaterials	*
CHE 4304/ME 4344	Biological Transport Phenomena	CHE 3044, CHE 3114, CHE 3144 or ME 3304, ME 3404
CS 4784	Human Computer Interaction	CS 3724, CS 3744
CS 4884	Computational Biology and Bioinformatics	CS 3824
ECE 4580	Digital Image Processing	ECE 4624, STAT 4714
ECE 4624	DSP and Filter Design	ECE 3704
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 2304, MATH 2214
ESM 4106	Engineering Analysis of Physiologic Systems II	ESM 2304, MATH 2214
ESM 4204	Musculoskeletal Biomechanics	CS 1044 or CS 1064 or CS 1114 or ESM/AOE 2074 and ESM 2304
ESM 4224	Biodynamics and Controls	ESM 3124, ESM 4204
ESM 4234	Mechanics of Biological Materials and Structures	ESM 3054
ESM 4245	Mechanics of Animal Locomotion	ESM 3054
ESM 4246	Mechanics of Animal Locomotion	ESM 3234
ESM 4304	Hemodynamics	ESM 3334 or ME 3404
ESM 5405/5406	Biomed Engr Intern	*
ISE 3614	Human Factors Engineering	STAT 4105
ISE 4624	Work Physiology	ISE 3614
ISE 5154	Applied Human Factors Engineering	*
ISE 5614/BMES 5214	Human Physical Capabilities	*
ISE 5644	Auditory Display Design	*
ME 4034	Bio-Inspired Technology	PHYS 2205, PHYS 2206 or PHYS 2305, PHYS 2306
ME 4864/5864G	Micro/Nanorobotics	MATH 2214, ME 3404, ME 3514

ME 5764/BMES 5764/ESM 5764	Modeling MEMS and NEMS	*
MSE 4574	Biomaterials	MSE/ESM 3054
MSE 4584	Biomimetic Materials	CHEM 1036 or BIOL 1106 or MSE 2034 or MSE 3094 or AOE 3094
MSE 4614	Nanomaterials	MSE 4034

* Students in their senior year, with a 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 and the Department Head.

Statement of Prerequisites:

- Pre-requisites for each 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. There are no hidden pre-requisites in the program of study. Prerequisites may change from what is indicated. Be sure to consult the University Catalog or check with your advisor for the most current pre-requisites.