

**College of Engineering  
Department of Biomedical Engineering and Mechanics  
Minor in Biomedical Engineering  
Students Graduating in Calendar Year 2017**

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<br>(PRE: ENGE 1104 or ENGE 1114, 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, MME 4535/6)
- Departmental undergraduate research course (BMES 4994, BSE 4994, CEE 4994, CHE 4994, CS 4994, ECE 4994, ESM 4994, ISE 4994, ME 4994, MSE 4994, MME 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**

<b>Course Number</b>	<b>Name</b>	<b>Pre-req</b>
BSE 4504	Bioprocess Engineering	BSE 3504, BIOL 2604, CHEM 2535 or CHEM 2565/H, (CHEM 3615/H or CHEM 4615)
BSE 4554/CHE 4544	Protein Separation Engineering	BSE 3504 or CHE 3144
CHE 4104	Process Materials	CHE 2164, CHEM 2535 or 2565
CHE 5214/BMES 5434	Polymeric Biomaterials	*
CHE 5304/BMES 5304	Biological Transport Phenomena	*
CS 4784	Human Computer Interaction	CS 3724, CS3744
CS 4884	Computational Biology and Bioinformatics	CS 3824
ECE 4580	Digital Image Processing	
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	ESM 2304, ESM 2074 or ME 2004
ESM 4224	Biodynamics and Controls	ESM 3124, ESM 4204
ESM 4234	Mechanics of Biological Materials and Structures	ESM 3054, ESM 2074 or ME 2004
ESM 4245	Mechanics of Animal Locomotion I	ESM 3054
ESM 4246	Mechanics of Animal Locomotion II	ESM 3054
ESM 4304	Hemodynamics	ESM 3016 or ME 3404
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 4754/BMES 5164	Impact Biomechanics	ESM 2204, ESM 2304
ME 4864/5864	Micro/Nanorobotics	MATH 2214, ME 3404, ME 3514
ME 5764/BMES 5764/ESM 5764	Modeling MEMS and NEMS	*
MSE 4574	Biomaterials	MSE 3054 or 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.