Biomedical Engineering – Program Map: Biomechanics & Biomaterials Focus Area

Semester 1
- Chem I / Lab — CHEM:1110
- Engr Math I — MATH:1550
- Intro Engr Prob Solving — ENGR:1100
- Rhetoric — RHET:1030
- Engr Success First Year — ENGR:1000

Semester 2
- Chem II / Lab — CHEM:1120
- Engr Math II — MATH:1560
- Engr Math III — MATH:2550
- Physics I / Lab — PHYS:1611
- Intro Engr Computing — ENGR:1300
- BME Forum — BME:1010

Semester 3
- Foundations of Biology / Lab — BIOL:1411
- Engr Math IV — MATH:2560
- Statics — ENGR:2110
- Elec Circuits — ENGR:2120
- Thermodynamics — ENGR:2130
- BME Prof Seminar — BME:2010

Semester 4
- Human Physiology HHP:3500 or BME:2260 Quantitative Physiology
- Biostatistics BIOS:4120 or STAT:3510
- Cell Biology for Engr / Lab — BME:2400
- Biomaterials & Biomechanics / Lab — BME:2500
- Dynamics — ENGR:2710

Semester 5
- Systems, Instrum, & Data Acquisition / Lab — BME:2200
- Bioimaging & Bioinformatics / Lab — BME:2210
- Mech Def Bodies — ENGR:2750
- Materials Science — ENGR:2720
- Diversity & Inclusion

Semester 6
- Focus Area Elective #1
- Focus Area Elective #2
- Focus Area Elective #3
- Fluid Mechanics — ENGR:2510
- Be Creative

Semester 7
- BME Senior Design I — BME:4910
- Focus Area Elective #4
- Focus Area Elective #5
- Focus Area Elective #6
- Approved GEC course

Semester 8
- BME Senior Design II — BME:4920
- Physics II / Lab — PHYS:1612
- Focus Area Elective #7
- Approved GEC course
- Approved GEC course

Legend
- **Math & Science Courses**
- **Required Engineering Courses**
- **Focus Area Required Courses**
- **General Education Courses**
- **Engineering Core Courses**
- **Biomedical Core Courses**
- **Focus Area Elective Courses**
- **Seminars**

At least two Focus Area Electives must be from the list of Engineering Topics.

Last updated 03/20/24

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Biomechanics & Biomaterials Required Courses

ENGR:2510	Fluid Mechanics	F/S	P: MATH:2560, ENGR:2710; C: ENGR:2130
ENGR:2710	Dynamics	All	P: MATH:1550, ENGR:2110
ENGR:2720	Materials Science	All	P: CHEM:1100; C: MATH:1550
ENGR:2750	Mechanics of Deformable Bodies	All	P: ENGR:2110; C: MATH:2560

Biomechanics & Biomaterials Electives (Focus Area, Minor, or Certificate)

Engineering Topics (must choose two)

BME:2710	Engr Drawing, Design, & Solid Modeling	F	
BME:5101	Biomaterials & Implant Design	F	P: ENGR:2750, BME:2500
BME:5610	Musculoskeletal Biomechanics	F	P: ENGR:2750, BME:2500
BME:5510	Cardiovascular Engineering	S	P: BME:2500
BME:5525	Cardiopulmonary Design & Modeling	F	P: BME:2500, ENGR:2510

Suggested Electives

BME:3710	Medical Device Design; The Fundamentals	S	P: BME:2710, BME:2500; intended for juniors only
BME:4710	Medical Device Design Studio	F	P: BME:2200, BME:2500, BME:2710, BME:3710
BME:5715	Advanced Medical Device Design Studio	S	P: BME:2200, BME:2500, BME:2710, 3710, 4710
BME:5421	Cell Material Interactions	F/S	P: BME:2400
BME:5430	Biotransport	F	P: BME:2500
BME:5431	Biofabrication for Tissue Engineering	S	P: ENGR:2110
BME:5441	Numerical & Stat. Methods for Bioengr.	F §	P: MATH:2560 and MATH:2550
BME:5460	Principles of Microfluidics	F	P: BME:2500
BME:5540	Quant. Studies of Respiratory & CV Syst.	S §	P: BME:2200, HHP:3500
BME:5620	Intro to Applied Biomedical Finite Element	S	P: BME:2500, ENGR:2750
BME:5630	Kinetics of Musculoskeletal Systems	S §	P: ENGR:2710
CEE:4533	Finite Element I (OR ME:4117)	S	P: ENGR:2750
ISE:2360	Design for Manufacturing (OR ME:2300)	F	C: ENGR:2720
ME:2300	Manufacturing Processes (OR ISE:2360)	F/S	C: ENGR:2720, ME:2200 or BME:2710
ME:4110	Computer Aided Engineering	S	P: ENGR:2750, ME:3052
ME:4117	Finite Element Analysis (OR CEE:4533)	F	P: ENGR:2750
HHP:1100	Human Anatomy	All	
HHP:4130	Skeletal Muscle Physiology	F	P: HHP:3500
HHP:4460	Cardiovascular Physiology	F	P: HHP:3500
OEH:4310	Occupational Ergonomics: Principles	F	

Pre-Medicine Electives

**BIOL:1412	Diversity of Form & Function	All	P: BIOL:1411 w/min C-
CHEM:2210	Organic Chemistry I	All	P: CHEM:1120 w/min C-
CHEM:2220	Organic Chemistry II	All	P: CHEM:2210 w/min C-
CHEM:2410	Organic Chemistry Lab	All	P: CHEM:1120 & CHEM:2210 w/min C-; C: CHEM:2220
BMB:3110	Biochemistry	All	See MyUI for requirements
BIOL:2512	Fundamental Genetics	All	P: BIOL:1411 w/min C-, BIOL:1412 or PSY:2701 w/min C-, CHEM:1110; Recommended: CHEM:2210

** Pre-medicine students should check with their Pre-medicine advisor regarding the need for this course.

§ Offered in academic years with odd fall and even spring semesters

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Note: At least two electives must be from the list of Engineering Topics. Electives not listed above may be approved via the Plan of Study form.

Please check MyUI for the current course offerings and pre/corequisites.

Last updated (3/23/24)