Biomedical Engineering – Program Map: Biomechanics & Biomaterials Focus Area

Semester	Course 1	Course 2	Course 3	Course 4	Course 5	Seminar
1	Principles Chem I / Lab **CHEM:1110** *(Math & Science)*	Engr Calculus I **MATH:1550** *(Math & Science)*	Intro Engineering Problem Solving **ENGR:1100** *(Engineering Core)*	Rhetoric **RHET:1030** *(Gen Ed)*	—	
2	Principles Chem II / Lab **CHEM:1120** *(Math & Science)*	Engr Calculus II **MATH:1560** *(Math & Science)*	Engr Matrix Algebra **MATH:2550** *(Math & Science)*	Physics I / Lab **PHYS:1611** *(Math & Science)*	Intro Engr Computing **ENGR:1300** *(Engineering Core)*	BME Forum **BME:1010**
3	Foundations of Biology / Lab **BIOL:1411** *(Math & Science)*	Engr Diff Equations **MATH:2560** *(Math & Science)*	Statics **ENGR:2110** *(Required Engineering)*	Electrical Circuits **ENGR:2120** *(Required Engineering)*	Thermodynamics **ENGR:2130** *(Required Engineering)*	BME Prof Seminar **BME:2010**
4	Fund Human Physiology **HHP:2400** or **BME:3260** Quantitative Physiology *(Math & Science)*	Biostatistics **BIOS:4120** or **STAT:3510** *(Math & Science)*	Systems, Instrum, & Data Acquisition / Lab **BME:2200** *(Biomedical Core)*	Biomaterials & Biomechanics / Lab **BME:2500** *(Biomedical Core)*	Dynamics **ENGR:2710** *(Focus Area Required)*	
5	Cell Biology for Engr / Lab **BME:2400** *(Biomedical Core)*	Bioimaging & Bioinformatics / Lab **BME:2210** *(Biomedical Core)*	Mech Def Bodies **ENGR:2750** *(Focus Area Required)*	Materials Science **ENGR:2720** *(Focus Area Required)*	Cultural Perspectives, Values, & Society *(Gen Ed)*	
6	Focus Area Elective #1	Focus Area Elective #2	Focus Area Elective #3	Fluid Mechanics **ENGR:2510** *(Focus Area Required)*	Be Creative *(Gen Ed)*	
7	BME Senior Design I **BME:4910** *(BME Core)*	Focus Area Elective #4	Focus Area Elective #5	Focus Area Elective #6	Approved Gen Ed course	
8	BME Senior Design II **BME:4920** *(BME Core)*	Physics II / Lab **PHYS:1612** *(Math & Science)*	Focus Area Elective #7	Approved Gen Ed course	Approved Gen Ed course	

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

Last updated 10/29/2025

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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:5510	Cardiovascular Engineering	S	P: BME:2500
BME:5525	Cardiopulmonary Design & Modeling	F	P: BME:2500, ENGR:2510
BME:5610	Musculoskeletal Biomechanics	F §§	P: ENGR:2750, BME:2500

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	S	P: BME:2400
BME:5430	Biotransport	F	C: BME:2500
BME:5431	Biofabrication for Tissue Engineering	S §§	P: ENGR:2110, BME:2400, BME:2500
BME:5441	Numerical & Stat. Methods for Bioengr.	F §	P: MATH:2560 and MATH:2550
BME:5460	Biomedical Micro Devices & Systems	F §	P: BME:2500
BME:5540	Quant. Studies of Respiratory & CV Syst.	S §	P: BME:2200, HHP:2400
BME:5620	Intro to Applied Biomedical Finite Element	S	P: BME:2500, ENGR:2750
BME:5630	Kinetics of Musculoskeletal Systems	S §	P: ENGR:2710
BME:3995	Undergraduate Research in BME	F/S	See MyUI for requirements
CEE:4533	Finite Element I (OR ME:4117)	S	P: ENGR:2750
ISE:2360	Design for Manufacturing (OR ME:2300)	F	
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:2100	Human Anatomy	All	
HHP:4130	Skeletal Muscle Physiology	F	P: HHP:3500 (HHP:2400 with faculty approval)
HHP:4460	Cardiovascular Physiology	F	P: HHP:3500 (HHP:2400 with faculty approval)
OEH:4310	Occupational Ergonomics: Principles	F	
MATH:3550	Engineering Vector Calculus	F/S	P: MATH:1560 & (MATH:2550 or MATH:2700); C: MATH:2560

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-, 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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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.

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