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	Intro Engr Computing ENGR:1300	Physics I / Lab PHYS:1611	BME Forum BME:1010
Semester 3	Foundations of Biology 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	Biomaterials & Biomechanics / Lab BME:2500	Dynamics ENGR:2710	Physics II / Lab PHYS:1612	Biostatistics BIOS:4120 or STAT:3510	
Semester 5	Cell Biology for Engr / Lab BME:2400	Materials Science ENGR:2720	Mech Def Bodies ENGR:2750	Fluid Mechanics ENGR:2510	Diversity & Inclusion	
Semester 6	Systems, Instrum, & Data Acquisition / Lab BME:2200	Bioimaging & Bioinformatics / Lab BME:2210	Focus Area Elective #1	Focus Area Elective #2	Be Creative	
Semester 7	BME Senior Design I BME:4910	Focus Area Elective #3	Focus Area Elective #4	Approved GEC course	Approved GEC course	
Semester 8	BME Senior Design II BME:4920	Focus Area Elective #5	Focus Area Elective #6	Focus Area Elective #7	Approved GEC course	

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.

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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: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
ME:5143	Computat. Fluid & Thermal Engineering	F	P: ME:3045
ME:5150	Intermediate Mechanics of Def. Bodies	F	P: ENGR:2750
ME:5160	Intermediate Mechanics of Fluids	F	P: ENGR:2510, ME:3040
ME:5167	Composite Materials (not offered regularly)	S	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.

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