

Biomedical Engineering – Program Map: Cellular Engineering Focus Area

Semester	Course 1	Course 2	Course 3	Course 4	Course 5	Seminar
1	Principles Chem I / Lab CHEM:1110 <i>(Math & Science)</i>	Engr Calculus I MATH:1550 <i>(Math & Science)</i>	Intro Engineering Problem Solving ENGR:1100 <i>(Engineering Core)</i>	Rhetoric RHET:1030 <i>(Gen Ed)</i>	—	
2	Principles Chem II / Lab CHEM:1120 <i>(Math & Science)</i>	Engr Calculus II MATH:1560 <i>(Math & Science)</i>	Engr Matrix Algebra MATH:2550 <i>(Math & Science)</i>	Physics I / Lab PHYS:1611 <i>(Math & Science)</i>	Intro Engr Computing ENGR:1300 <i>(Engineering Core)</i>	BME Forum BME:1010
3	Foundations of Biology / Lab BIOL:1411 <i>(Math & Science)</i>	Engr Diff Equations MATH:2560 <i>(Math & Science)</i>	Statics ENGR:2110 <i>(Required Engineering)</i>	Electrical Circuits ENGR:2120 <i>(Required Engineering)</i>	Thermodynamics ENGR:2130 <i>(Required Engineering)</i>	BME Prof Seminar BME:2010
4	Fund Human Physiology HHP:2400 or BME:3260 Quantitative Physiology <i>(Math & Science)</i>	Biostatistics BIOS:4120 or STAT:3510 <i>(Math & Science)</i>	Bioimaging & Bioinformatics / Lab BME:2210 <i>(Biomedical Core)</i>	Cell Biology for Engr / Lab BME:2400 <i>(Biomedical Core)</i>	Mech Def Bodies ENGR:2750 <i>(Focus Area Required)</i>	
5	Systems, Instrum, & Data Acquisition / Lab BME:2200 <i>(Biomedical Core)</i>	Biomaterials & Biomechanics / Lab BME:2500 <i>(Biomedical Core)</i>	Focus Area Elective #1	Focus Area Elective #2	Cultural Perspectives, Values, & Society <i>(Gen Ed)</i>	
6	Focus Area Elective #3	Focus Area Elective #4	Any required focus area course from the other BME focus areas	Cell Material Interactions BME:5421 <i>(Focus Area Required)</i>	Be Creative <i>(Gen Ed)</i>	
7	BME Senior Design I BME:4910 <i>(BME Core)</i>	Focus Area Elective #5	Focus Area Elective #6	Biotransport BME:5430 <i>(Focus Area Required)</i>	Approved Gen Ed course	
8	BME Senior Design II BME:4920 <i>(BME Core)</i>	Physics II / Lab PHYS:1612 <i>(Math & Science)</i>	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.

Biomedical Engineering – Program Map: Cellular Engineering Focus Area

Cellular Engineering Required Courses

ENGR:2750	Mechanics of Deformable Bodies	All	P: ENGR:2110; C: MATH:2560
BME:5421	Cell Material Interactions	S	P: BME:2400
BME:5430	Biotransport	F	C: BME:2500
XXXX:####	Any required focus area course		(From the other BME Focus Areas)

Cellular Engineering Electives (Focus Area, Minor, or Certificate)

Engineering Topics (must choose two)

BME:4310	Computational Biochemistry	F	P: MATH:1560 or MATH:1860, CHEM:1120
BME:5441	Num. & Stat. Methods for Bioengr.	F §	P: MATH:2560 and MATH:2550
BME:5445	Stem Cells in Regenerative Engr	F §§	P: BME:2400 or BIOL:2723
BME:5451	Research Methods in Cellular Engr	S	P: BIOL:1411, STAT:3510 or BIOS:4120
ECE:5480	Digital Image Processing	F	P: BME:2200

Suggested Electives

BME:5431	Biofabrication for Tissue Engr	S §§	P: ENGR:2110, BME:2400, BME:2500
BME:5460	Biomed Micro Devices & Systems	F §	P: BME:2500
BME:5525	Cardiopulmonary Modeling & Design	F	P: BME:2500, ENGR:2510
BME:3995	Undergraduate Research in BME	F/S	See MyUI for requirements
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:1110; C: MATH:1550
ENGR:2730	Computers in Engineering	F/S	P: ENGR:1300
ME:5179	Continuum Mechanics	See MyUI	P: ENGR:2750 or ENGR:2510
BIOL:1412	Diversity of Form & Function	All	P: BIOL:1411 w/min C-
BIOL:2512	Fundamental Genetics	All	P: BIOL:1411 w/min C-, CHEM:1110; Recommended: CHEM:2210
BMB:3120	Biochemistry & Molecular Biology I	F/S	See MyUI for recommendations
BMB:3130	Biochemistry & Molecular Biology II	F/S	P: BMB:3120
MATH:4750	Intro to Mathematical Biology	S	P: MATH:3600 or MATH:2560
MATH:3550	Engineering Vector Calculus	F/S	P: MATH:1560 & (MATH:2550 or MATH:2700); C: MATH:2560

Pre-Medicine

**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 w/min C-, 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

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

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 (10/29/25)