

Biomedical Engineering – Program Map: Cellular Engineering 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	Biomaterials & Biomechanics / Lab BME:2500	Cell Biology for Engr / Lab BME:2400	Mech Def Bodies ENGR:2750	
Semester 5	Bioimaging & Bioinformatics / Lab BME:2210	Systems, Instrum, & Data Acquisition / Lab BME:2200	Focus Area Elective #1	Focus Area Elective #2	Diversity & Inclusion	
Semester 6	Focus Area Elective #3	Focus Area Elective #4	Systems Biology for BME BME:5435	Cell Material Interactions BME:5421	Be Creative	
Semester 7	BME Senior Design I BME:4910	Focus Area Elective #5	Focus Area Elective #6	Biotransport BME:5430	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	

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

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

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Cellular Engineering Required Courses

ENGR:2750	Mechanics of Deformable Bodies	All	P: ENGR:2110; C: MATH:2560
BME:5421	Cell Material Interactions	F/S	P: BME:2400
BME:5430	Biotransport	F	P: BME:2500
BME:5435	Systems Biology for BME	S	P: BME:2400, BME:2200

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:5460	Principles of Microfluidics	F	P: BME:2500
BME:5525	Cardiopulmonary Modeling & Design	F	P: BME:2500, ENGR:2510
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-, BIOL:1412 or PSY:2701 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

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-, 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)