

# Biomedical Engineering – Program Map: Cellular Engineering Focus Area

<b>Semester 1</b>	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	
<b>Semester 2</b>	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
<b>Semester 3</b>	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
<b>Semester 4</b>	Human Physiology HHP:3500 or Quantitative Physiology BME:2260	Biostatistics BIOS:4120 or STAT:3510	Bioimaging & Bioinformatics / Lab BME:2210	Cell Biology for Engr / Lab BME:2400	Mech Def Bodies ENGR:2750	
<b>Semester 5</b>	Systems, Instrum, & Data Acquisition / Lab BME:2200	Biomaterials & Biomechanics / Lab BME:2500	Focus Area Elective #1	Focus Area Elective #2	Cultural Perspectives, Values, and Society	
<b>Semester 6</b>	Focus Area Elective #3	Focus Area Elective #4	Any required focus area course from the other BME focus areas	Cell Material Interactions BME:5421	Be Creative	
<b>Semester 7</b>	BME Senior Design I BME:4910	Focus Area Elective #5	Focus Area Elective #6	Biotransport BME:5430	Approved GEC course	
<b>Semester 8</b>	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
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
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

#### 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**

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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 (10/16/24)**