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** *(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)*	Bioimaging & Bioinformatics / Lab **BME:2210** *(Biomedical Core)*	Cell & Tissue Engineering Fundamentals / Lab **BME:2400** *(Biomedical Core)*	Mech Def Bodies **ENGR:2750** *(Focus Area Required)*	
5	Systems, Instrum, & Data Acquisition / Lab **BME:2200** *(Biomedical Core)*	Biomaterials & Biomechanics / Lab **BME:2500** *(Biomedical Core)*	Focus Area Elective #1	Focus Area Elective #2	Cultural Perspectives, Values, & Society *(Gen Ed)*	
6	Focus Area Elective #3	Focus Area Elective #4	Any required focus area course from the other BME focus areas OR Systems Biology for BME **BME:5435**	Cell Material Interactions **BME:5421** *(Focus Area Required)*	Be Creative *(Gen Ed)*	
7	BME Senior Design I **BME:4910** *(BME Core)*	Focus Area Elective #5	Focus Area Elective #6	Biotransport **BME:5430** *(Focus Area Required)*	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 05/11/2026

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Cellular Engineering Required Courses		Semester	
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	F/S	See MyUI for requirements
BIOL:2512	Fundamental Genetics	All	P: BIOL:1411 w/min C-, CHEM:1110; Recommended: CHEM:2210

+ When it is offered, BME:5435 Systems Biology for BME can also count as a required focus area course.

**** 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.

Last updated (10/19/26)