

Biomedical Engineering – Program Map: Cellular Engineering Focus Area

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|-------------------|--|--|---|--|--|---------------------------------|
| Semester 1 | Chem I / Lab CHEM:1110 | Engr Calc 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 Calc II MATH:1560 | Engr Matrix Alg 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 Diff Equat MATH:2560 | Statics ENGR:2110 | Elec Circuits ENGR:2120 | Thermodynamics ENGR:2130 | BME Prof Seminar BME:2010 |
| Semester 4 | Fund Human Physiology HHP:2400 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 | |
| Semester 5 | 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 | |
| Semester 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 | 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

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| 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 | 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)

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|----------|-----------------------------------|------|--------------------------------------|
| 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

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|-----------|-------------------------------------|----------|--|
| 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 |
| MATH:3550 | Engineering Vector Calculus | F/S | P: MATH:1560 & (MATH:2550 or MATH:2700); C: MATH:2560 |

Pre-Medicine

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|-------------|------------------------------|-----|---|
| **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 (01/27/25)