## Biomedical Engineering – Program Map: Biomechanics & Biomaterials Focus Area

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 3</th>
<th>Semester 4</th>
<th>Semester 5</th>
<th>Semester 6</th>
<th>Semester 7</th>
<th>Semester 8</th>
</tr>
</thead>
</table>
| 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 |
| Chem II & Lab  
CHEM:1120 | Engr Math II  
MATH:1560 | Engr Math III  
MATH:2550 | Intro Engr Computing  
ENGR:1300 | Physics I / Lab  
PHYS:1611  
BME Forum  
BME:1010 |
| Foundations of Biology  
BIOL:1411 | Engr Math IV  
MATH:2560 | Statics  
ENGR:2110 | Elec Circuits  
ENGR:2120 | Thermodynamics  
ENGR:2130  
BME Prof Seminar  
BME:2010 |
| Human Physiology  
HHP:3500 or BME:2260  
Quantitative Physiology  
BME:2500 | Biomaterials & Biomechanics  
Lab BME:2500 | Dynamics  
ENGR:2710 | Physics II / Lab  
PHYS:1612  
Biostatistics  
BIOS:4120 or  
STAT:3510 |
| Cell Biology for Engr / Lab  
BME:2400 | Materials Science  
ENGR:2720 | Mech Def Bodies  
ENGR:2750 | Fluid Mechanics  
ENGR:2510 | Diversity & Inclusion |
| Systems, Instrum,  
& Data Acquisition  
Lab BME:2200 | Bioimaging & Bioinformatics  
Lab BME:2210 | Focus Area Elective #1 | Focus Area Elective #2 | Be Creative |
| BME Senior Design I  
BME:4910 | Focus Area Elective #3 | Focus Area Elective #4 | Approved GEC course | Approved GEC course |
| BME Senior Design II  
BME:4920 | Focus Area Elective #5 | Focus Area Elective #6 | Focus Area Elective #7 | Approved GEC course |

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

At least two Focus Area Electives must be from the list of Engineering Topics.
Biomedical Engineering – Program Map: Biomechanics & Biomaterials Focus Area

**Biomechanics & Biomaterials Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Delivery</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR:2510</td>
<td>Fluid Mechanics</td>
<td>F/S</td>
<td>P: MATH:2560, ENGR:2710; C: ENGR:2130</td>
</tr>
<tr>
<td>ENGR:2710</td>
<td>Dynamics</td>
<td>All</td>
<td>P: MATH:1550, ENGR:2110</td>
</tr>
<tr>
<td>ENGR:2720</td>
<td>Materials Science</td>
<td>All</td>
<td>P: CHEM:1100; C: MATH:1550</td>
</tr>
<tr>
<td>ENGR:2750</td>
<td>Mechanics of Deformable Bodies</td>
<td>All</td>
<td>P: ENGR:2110; C: MATH:2560</td>
</tr>
</tbody>
</table>

**Biomechanics & Biomaterials Electives (Focus Area, Minor, or Certificate)**

**Engineering Topics (must choose two)**

- BME:2710 Engr Drawing, Design, & Solid Modeling  F
- BME:5101 Biomaterials & Implant Design          1  F  P: ENGR:2750, BME:2500
- BME:5610 Musculoskeletal Biomechanics           1  F  P: ENGR:2750, BME:2500
- BME:5510 Cardiovascular Engineering             S  P: BME:2500
- BME:5525 Cardiopulmonary Design & Modeling      F  P: BME:2500, ENGR:2510

**Suggested Electives**

- BME:3710 Medical Device Design; The Fundamentals S  P: BME:2710, BME:2500; intended for juniors only
- BME:5715 Advanced Medical Device Design Studio S  P: BME:2200, BME:2500, BME:2710, 3710, 4710
- BME:5421 Cell Material Interactions             F/S P: BME:2400
- BME:5430 Biotransport                           F  P: BME:2500
- BME:5460 Principles of Microfluidics            F  P: BME:2500
- BME:5620 Intro to Applied Biomedical Finite Element S  P: BME:2500, ENGR:2750
- BME:5630 Kinetics of Musculoskeletal Systems    S  §  P: ENGR:2710
- CEE:4533 Finite Element I (OR ME:4117)          S  P: ENGR:2750
- ISE:2360 Design for Manufacturing (OR ME:2300)  F  C: ENGR:2720
- ME:2300 Manufacturing Processes (OR ISE:2360)   F/S C: ENGR:2720, ME:2200 or BME:2710
- ME:4110 Computer Aided Engineering              S  P: ENGR:2750, ME:3052
- ME:4117 Finite Element Analysis (OR CEE:4533)   F  P: ENGR:2750
- ME:5143 Computat. Fluid & Thermal Engineering   F  P: ME:3045
- ME:5167 Composite Materials (not offered regularly) S  P: ENGR:2750
- HHP:1100 Human Anatomy                           All
- HHP:4130 Skeletal Muscle Physiology              F  P: HHP:3500
- HHP:4460 Cardiovascular Physiology               F  P: HHP:3500
- OEH:4310 Occupational Ergonomics: Principles    F

**Pre-Medicine Electives**

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

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 (03/20/23)