### Biomedical Engineering – Program Map: Bioimaging 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
- **Intro Engr Computing**
  - ENGR:1300
- **Physics I / Lab**
  - PHYS:1611
- **BME Forum**
  - BME:1010

#### Semester 3
- **Foundations of Biology**
  - BIOL:1411
- **Engr Math IV**
  - MATH:2560
- **Statics**
  - ENGR:2110
- **Elec Circuits**
  - ENGR:2120
- **Thermo ENGR:2130 or Intro AI & Mach Learning ENGR:2995**
- **BME Prof Seminar**
  - BME:2010

#### Semester 4
- **Human Physiology**
  - HHP:3500
- **Systems, Instrum, & Data Acquisition / Lab**
  - BME:2200
- **Bioimaging & Bioinformatics / Lab**
  - BME:2210
- **Comp in Engr**
  - ENGR:2730
- **Biostatistics**
  - BIOS:4120 or STAT:3510
- **BME Prof Seminar**
  - BME:2010

#### Semester 5
- **Cell Biology for Engr / Lab**
  - BME:2400
- **Biomaterials & Biomechanics / Lab**
  - BME:2500
- **Medical Imaging Physics**
  - BME:5210
- **Intro to Software Design**
  - ECE:3330
- **Diversity & Inclusion**
- **Leadership & Resourcefulness**
  - BME:3010

#### Semester 6
- **Focus Area Elective #1**
- **Focus Area Elective #2**
- **Physics II / Lab**
  - PHYS:1612
- **Be Creative**
- **Approved GEC course**
- **BME Design Seminar**
  - BME:4010

#### Semester 7
- **BME Senior Design I**
  - BME:4910
- **Digital Image Processing**
  - ECE:5480
- **Focus Area Elective #3**
- **Focus Area Elective #4**
- **Approved GEC course**

#### Semester 8
- **BME Senior Design II**
  - BME:4920
- **Focus Area Elective #5**
- **Focus Area Elective #6**
- **Focus Area Elective #7**
- **Approved GEC course**

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*ENGR:2995 will be not be offered in Fall 2021 but will be offered in Spring 2022. Students who want to take ENGR:2995 and not ENGR:2130 can take ENGR:2730 Computers in Engr in Semester 3 and ENGR:2995 in Semester 4.*

Note: At least two Focus Area Electives must be from the list of Engineering Topics.
**Biomedical Engineering – Program Map:** Bioimaging Focus Area

### Bioimaging Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Term</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME:5210</td>
<td>Medical Imaging Physics</td>
<td>F</td>
<td>P: BME:2200, BME:2210</td>
</tr>
<tr>
<td>ENGR:2730</td>
<td>Computers in Engineering</td>
<td>F/Sp</td>
<td>P: ENGR:1300</td>
</tr>
<tr>
<td>ECE:3330</td>
<td>Intro to Software Design</td>
<td>F/Sp</td>
<td>P: ENGR:2730</td>
</tr>
<tr>
<td>ECE:5480</td>
<td>Digital Image Processing</td>
<td>F</td>
<td>P: BME:2200 or ECE:2400</td>
</tr>
</tbody>
</table>

### Bioimaging Electives (Focus Area, Minor, or Certificate)

#### Engineering Topics (must choose two)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BME:5200</td>
<td>Biomedical Signal Processing</td>
<td>Sp</td>
<td>P: ECE:5480 and (ECE:3330 or CS:2820)</td>
</tr>
<tr>
<td>ECE:5490</td>
<td>Multidimensional Image Analysis Tools &amp; Techniques</td>
<td>Every other Sp (odd years)</td>
<td>P: BME:2200</td>
</tr>
<tr>
<td>BME:5251</td>
<td>Advanced Biosystems</td>
<td>Sp</td>
<td>P: ECE:3330</td>
</tr>
<tr>
<td>ECE:5330</td>
<td>Graph Algorithms &amp; Combinatorial Optimization</td>
<td>Sp</td>
<td>P: ECE:3330</td>
</tr>
<tr>
<td>ECE:5450</td>
<td>Machine Learning</td>
<td>F</td>
<td>P: ECE:2400</td>
</tr>
</tbody>
</table>

#### Suggested Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Term</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME:5340:0001</td>
<td>Contemp. Topics in BME: Principles of Magnetic Resonance Imaging</td>
<td>Sp</td>
<td>P: BME:5210 or BME:5200 or ECE:5460</td>
</tr>
<tr>
<td>MATH:3800</td>
<td>Elementary Numerical Analysis</td>
<td>F/Sp</td>
<td>P: (MATH:2550 or MATH:2700) and (MATH:1560 or MATH:1860)</td>
</tr>
<tr>
<td>CS:4480</td>
<td>Knowledge Discovery</td>
<td>F</td>
<td>P: ECE:3400</td>
</tr>
<tr>
<td>ECE:5460</td>
<td>Digital Signal Processing</td>
<td>F</td>
<td>P: ECE:3400</td>
</tr>
<tr>
<td>CS:2210</td>
<td>Discrete Structures</td>
<td>All</td>
<td>P: ENGR:2730 or CS:1210</td>
</tr>
<tr>
<td>CS:2230</td>
<td>Data Structures</td>
<td>All</td>
<td></td>
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#### Pre-Medicine

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Term</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOL:1412</strong></td>
<td>Diversity of Form &amp; Function</td>
<td>All</td>
<td>P: BIOL:1411 w/min C-</td>
</tr>
<tr>
<td>CHEM:2210</td>
<td>Organic Chemistry I</td>
<td>All</td>
<td>P: CHEM:1120 w/min C-</td>
</tr>
<tr>
<td>CHEM:2220</td>
<td>Organic Chemistry II</td>
<td>All</td>
<td>P: CHEM:2210 w/min C-</td>
</tr>
<tr>
<td>CHEM:2410</td>
<td>Organic Chemistry Lab</td>
<td>All</td>
<td>P: CHEM:1120 w/min C-; CHEM:2210 w/min C-; C: CHEM:2220</td>
</tr>
<tr>
<td>BIOC:3110</td>
<td>Biochemistry</td>
<td>All</td>
<td>See MyUI for requirements</td>
</tr>
<tr>
<td>BIOL:2512</td>
<td>Fundamental Genetics</td>
<td>All</td>
<td>P: BIOL:1411, BIOL:1412 or PSY:2701, CHEM:1110; Recommended: CHEM:2210</td>
</tr>
</tbody>
</table>

**Pre-medicine students should check with their Pre-medicine advisor regarding the need for this course.**

**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 most up to date course offerings and pre/corequisites.

See the BME [Bioimaging Focus Area web page](#) for a link to a guide for courses with machine learning content.

Last updated (09/02/21)