## Biomedical Engineering – Program Map: Bioinformatics Track

### Track Requisites

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Semester</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR:2730</td>
<td>Computers in Engineering</td>
<td>F/S</td>
<td>P: ENGR:1300</td>
</tr>
<tr>
<td>ECE:3330</td>
<td>Intro to Software Design</td>
<td>F/S</td>
<td>P: ENGR:2730</td>
</tr>
<tr>
<td>BME:5320</td>
<td>Bioinformatics Techniques</td>
<td>F</td>
<td>P: ENGR:2730 or CS:2110 or CS:5110, BIOL:1411</td>
</tr>
<tr>
<td>BME:5330</td>
<td>Computational Genomics</td>
<td>Sp (even)</td>
<td>P: ENGR:1300, (BIOS:4120 or STAT:3510); or consent of instructor</td>
</tr>
</tbody>
</table>

### Track Electives

#### Engineering Topics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Semester</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE:4172</td>
<td>Big Data Analytics</td>
<td>F</td>
<td>P: STAT:2020</td>
</tr>
<tr>
<td>ECE:5450</td>
<td>Machine Learning</td>
<td>F</td>
<td>P: ECE:2400</td>
</tr>
<tr>
<td>ECE:4480</td>
<td>Knowledge Discovery</td>
<td>F</td>
<td></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>BME:4310</td>
<td>Computational Biochemistry</td>
<td>F (even)</td>
<td>P: MATH:1560 or MATH:1860, CHEM:1120</td>
</tr>
</tbody>
</table>

#### Suggested Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Semester</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH:2320</td>
<td>Origins of Human Infectious Disease</td>
<td>F</td>
<td></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>
<tr>
<td>BIOL:3314</td>
<td>Genomics</td>
<td>Sp</td>
<td>P: BIOL:2512 or BIOL:3210</td>
</tr>
<tr>
<td>BIOL:4213</td>
<td>Bioinformatics</td>
<td>F</td>
<td>P: BIOL:2512 or BIOL:3120</td>
</tr>
<tr>
<td>CS:3330</td>
<td>Algorithms</td>
<td>All</td>
<td>P: CS:2210 and CS:2230 (min C-), MATH:1850 or MATH:1550 or MATH:1860 or MATH:1560</td>
</tr>
<tr>
<td>CS:4740</td>
<td>Large Data Analysis</td>
<td>Sp</td>
<td>P: (CS:1210 or ENGR:2730) and (MATH:2700 or MATH:2550) and (STAT:2010 or STAT:2020)</td>
</tr>
<tr>
<td>CS:5350</td>
<td>Design and Analysis of Algorithms</td>
<td>Sp</td>
<td>P: CS:3330 or CS:5340</td>
</tr>
<tr>
<td>ECE:5800</td>
<td>Fundamentals of Software Engineering</td>
<td>F/Sp</td>
<td>P: CS:2820 or ECE:3330</td>
</tr>
<tr>
<td>ECE:5820</td>
<td>Software Engineering Languages &amp; Tools</td>
<td>F</td>
<td>P: CS:2820 or ECE:3330</td>
</tr>
</tbody>
</table>

#### Pre-Medicine

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Semester</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL:1412</td>
<td>Diversity of Form &amp; Function</td>
<td>All</td>
<td>P: BIOL:1411, CHEM:1110</td>
</tr>
<tr>
<td>CHEM:2210</td>
<td>Organic Chemistry I</td>
<td>All</td>
<td>P: CHEM:1120</td>
</tr>
<tr>
<td>CHEM:2220</td>
<td>Organic Chemistry II</td>
<td>All</td>
<td>P: CHEM:2210</td>
</tr>
<tr>
<td>CHEM:2410</td>
<td>Organic Chemistry Lab</td>
<td>All</td>
<td>P: CHEM:1110, CHEM:1120, CHEM:2210</td>
</tr>
<tr>
<td>BIOL: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>

**Note:** At least two electives must be from the list of Engineering Topics. Please check MyUI for the most up to date course offerings and pre/corequisites. Last updated (11/15/19)
Biomedical Engineering – Program Map: Bioinformatics Track

**Semester 1**
- Chem. I & Lab
  - CHEM:1110
- Math I
  - MATH:1550
- Eng. Prob. Solving
  - ENGR:1100
- Rhetoric
  - RHET:1030
- Engr Success
  - First Year
  - ENGR:1000

**Semester 2**
- Chem. II & Lab
  - CHEM:1120
- Math II
  - MATH:1560
- Math III
  - MATH:2550
- Eng. Computing
  - ENGR:1300
- Physics I / Lab
  - PHYS:1611
- BME Forum
  - BME:1010

**Semester 3**
- Foundations of Biology
  - BIOL:1411
- Math IV
  - MATH:2560
- Statics
  - ENGR:2110
- Elec. Circuits
  - ENGR:2120
- Thermo
  - ENGR:2130
- BME Seminar
  - BME:2010

**Semester 4**
- Human Physiol.
  - HHP:3500
- Systems, Instrum, & Data Acquisition
  - Lab BME:2200
- Bioimaging & Bioinformatics / Lab
  - BME:2210
- CIE
  - ENGR:2730
- Biostatistics
  - BIOS:4120
  - or STAT:3510
- BME Seminar
  - BME:2010

**Semester 5**
- Cell Biology for Engr / Lab
  - BME:2400
- Intro to Software Design
  - ECE:3330
- Bioinformatics Techniques
  - BME:5320
  - (Fall – odd years)
- Track Elective #1
- GEC Elective #1
- Leadership & Resourcefulness
  - BME:3010

**Semester 6**
- Computational Genomics
  - BME:5330
  - (Spring – even years)
- Track Elective #2
- Track Elective #3
- GEC Elective #2
- GEC Elective #3
- BME Design Seminar
  - BME:4010

**Semester 7**
- BME Design I
  - BME:4910
- Track Elective #4
- Track Elective #5
- GEC Elective #4
- GEC Elective #5

**Semester 8**
- BME Design II
  - BME:4920
- Track Elective #6
- Track Elective #7
- Physics II / Lab
  - PHYS:1612
- GEC Elective #5