**BS in Biomedical Engineering**

**Program Codes:**
20FQ5971BS

**Degree Requirements**
To earn a Bachelor of Science in Biomedical Engineering degree from UIC, students need to complete university, college, and department degree requirements. The Department of Biomedical Engineering degree requirements are outlined below. Students should consult the College of Engineering section for additional degree requirements and college academic policies.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Summary of Requirements</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nonengineering and General Education Requirements</td>
<td>64-65</td>
</tr>
<tr>
<td></td>
<td>Required Engineering Courses</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Selective Engineering Courses</td>
<td>7-8</td>
</tr>
<tr>
<td></td>
<td>Biomedical Engineering Concentration Area Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>128</td>
</tr>
</tbody>
</table>

**Nonengineering and General Education Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>CHEM 122</strong> Matter and Energy b</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>CHEM 123</strong> Foundations of Chemical Inquiry I a,b</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>CHEM 124</strong> Chemical Dynamics b</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>CHEM 125</strong> Foundations of Chemical Inquiry II a,b</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>PHYS 141</strong> General Physics I (Mechanics) a</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>PHYS 142</strong> General Physics II (Electricity and Magnetism) (Electricity and Magnetism) a</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>MATH 180</strong> Calculus I a</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>MATH 181</strong> Calculus II a</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>MATH 210</strong> Calculus III a</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>MATH 220</strong> Introduction to Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>MATH 310</strong> Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>ENGL 160</strong> Academic Writing I: Writing in Academic and Public Contexts</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>ENGL 161</strong> Academic Writing II: Writing for Inquiry and Research</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Exploring World Cultures course c</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Understanding the Creative Arts course c</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Understanding the Individual and Society course c</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Understanding the Past course e</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Understanding U.S. Society course c</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BIOS 110</strong> Biology of Cells and Organisms a</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td><strong>BIOS 220</strong> Genetics</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>BIOS 222</strong> Cell Biology</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>BIOS 286</strong> The Biology of the Brain</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>64-65</td>
</tr>
</tbody>
</table>

- **Nonengineering and General Education Requirements**
  
  a. This course is approved for the Analyzing the Natural World General Education category.
  
  b. General Education credit is given for successful completion of both CHEM 122 and CHEM 123.
  
  c. Students should consult the General Education section of the catalog for a list of courses in this category. One of these General Education courses should be 4 hours to reach the total required nonengineering and General Education hours.

**Required Engineering Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>ENGR 100</strong> Engineering Success Seminar a</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>BME 101</strong> Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 102</strong> Biomedical Engineering Freshman Seminar</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>CS 109</strong> Programming for Engineers with MatLab</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 205</strong> Biomedical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>ECE 210</strong> Electrical Circuit Analysis</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 240</strong> Modeling Physiological Data and Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 250</strong> Clinical Problems in Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>CME 260</strong> Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 325</strong> Biotransport</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 310</strong> Biological Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 332</strong> Bioinstrumentation and Measurements I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 333</strong> Bioinstrumentation and Measurement Laboratory I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>BME 339</strong> Biostatistics I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 396</strong> Senior Design I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 397</strong> Senior Design II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>BME 399</strong> Professional Development for Biomedical Engineers</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>BME 460</strong> Materials in Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>45</td>
</tr>
</tbody>
</table>

- **ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.**

**Selective Engineering Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required Courses</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>BIOS 340</strong> Environmental Physiology</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CHEM 232</strong> Structure and Function</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>64-65</td>
</tr>
</tbody>
</table>

- **Biomedical Product Development courses:**
  
  2-3
  
  a. Select one of the following:
  
  - **BME 402** Medical Technology Assessment
  - **BME 403** Quality Assurance for Medical Products
  - **BME 408** Medical Product Development
BME 410  FDA and ISO Requirements for the Development and Manufacturing of Medical Devices

Select one of the following capstone lecture courses:  

3

BME 421  Biomedical Imaging
BME 455  Introduction to Cell and Tissue Engineering
BME 475  Neural Engineering I: Introduction to Hybrid Neural Systems
BME 480  Intro to Bioinformatics

Select one of the following capstone lab courses:  

2

BME 423  Biomedical Imaging Laboratory
BME 456  Cell & Tissue Laboratory
BME 476  Neural Engineering I Laboratory
BME 481  Bioinformatics Laboratory

Total Hours  7-8

a  Students must select a pair of capstone lecture and lab courses (BME 455/BME 456, BME 475/BME 476, BME 480/BME 481, BME 421/BME 423) as part of the requirements to complete a Biomedical Engineering Concentration Area.

Biomedical Engineering Concentration Area Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

These courses are to be selected in consultation with the advisor, must relate to each other and to the Capstone Lecture course in such a way as to define an area of concentration in Neural Engineering, Bioinformatics, Cell and Tissue Engineering, or Biomedical Imaging, and are subject to the following restrictions:

1. A minimum of 3 hours must be upper-division (300- or 400-level) biomedical engineering or other engineering courses, excluding courses in the MENG rubric, and excluding BME 398.
2. No courses at the 100 level may be applied as concentration area and elective courses.
3. Math, science, and health courses may be used only if they substantially complement the chosen concentration area.
4. Prerequisite courses for Capstone Lecture courses (BME 421, BME 455, BME 475, BME 480) are automatically approved.
5. A maximum of 6 hours of BME 398 may be applied as concentration area elective hours.
5. A maximum of one course from the following list may be applied as concentration area elective hours:

- MENG 400  Engineering Law
- MENG 401  Engineering Management
- MENG 402  Intellectual Property Law
- MENG 403  Reliability Engineering

Total Hours  12

Sample Course Schedule

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME 101</td>
<td>Introduction to Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Engineering Success Seminar a</td>
<td>1</td>
</tr>
<tr>
<td>MATH 180</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>BIOS 110</td>
<td>Biology of Cells and Organisms</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 122</td>
<td>Matter and Energy</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 123</td>
<td>Foundations of Chemical Inquiry I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>16</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME 102</td>
<td>Biomedical Engineering Freshman Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MATH 181</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CS 109</td>
<td>Programming for Engineers with MatLab</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 124</td>
<td>Chemical Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 125</td>
<td>Foundations of Chemical Inquiry II</td>
<td>2</td>
</tr>
<tr>
<td>ENGL 160</td>
<td>Academic Writing I: Writing in Academic and Public Contexts</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>16</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 141</td>
<td>General Physics I (Mechanics)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 210</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>BIOS 286</td>
<td>The Biology of the Brain</td>
<td>3</td>
</tr>
<tr>
<td>BME 240</td>
<td>Modeling Physiological Data and Systems</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 161</td>
<td>Academic Writing II: Writing for Inquiry and Research</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>16</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME 250</td>
<td>Clinical Problems in Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>BME 205</td>
<td>Biomedical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 142</td>
<td>General Physics II (Electricity and Magnetism)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 220</td>
<td>Introduction to Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 310</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>16</td>
</tr>
<tr>
<td>Junior Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME 310</td>
<td>Biological Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BME 325</td>
<td>Biotransport</td>
<td>3</td>
</tr>
<tr>
<td>BME 339</td>
<td>Biostatistics I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 210</td>
<td>Electrical Circuit Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Concentration Area Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>General Education Core course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>18</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME 332</td>
<td>Bioinstrumentation and Measurements I</td>
<td>3</td>
</tr>
<tr>
<td>BME 333</td>
<td>Bioinstrumentation and Measurement Laboratory I</td>
<td>2</td>
</tr>
<tr>
<td>BME 399</td>
<td>Professional Development for Biomedical Engineers</td>
<td>0</td>
</tr>
<tr>
<td>BME 402</td>
<td>Medical Technology Assessment</td>
<td>2</td>
</tr>
<tr>
<td>CME 260</td>
<td>Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>Concentration Area Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>General Education Core course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>16</td>
</tr>
<tr>
<td>Senior Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME 396</td>
<td>Senior Design I</td>
<td>3</td>
</tr>
<tr>
<td>BME 460</td>
<td>Materials in Biomedical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Concentration Area Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>General Education Core courses</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>13</td>
</tr>
</tbody>
</table>
Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME 397 Senior Design II</td>
<td>3</td>
</tr>
<tr>
<td>Capstone Lecture course</td>
<td>3</td>
</tr>
<tr>
<td>Capstone Laboratory course</td>
<td>2</td>
</tr>
<tr>
<td>Concentration Area Elective course</td>
<td>3</td>
</tr>
<tr>
<td>General Education Core courses</td>
<td>6</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>128</strong></td>
</tr>
</tbody>
</table>

a  *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*