

# 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.

Code	Title	Hours
<b>Summary of Requirements</b>		
Nonengineering and General Education Requirements		64-65
Required Engineering Courses		45
Selective Engineering Courses		7-8
Biomedical Engineering Concentration Area Electives		12
<b>Total Hours</b>		<b>128</b>

## Nonengineering and General Education Requirements

Code	Title	Hours
<b>Required Courses</b>		
CHEM 122	Matter and Energy <sup>b</sup>	3
CHEM 123	Foundations of Chemical Inquiry I <sup>a,b</sup>	2
CHEM 124	Chemical Dynamics <sup>b</sup>	3
CHEM 125	Foundations of Chemical Inquiry II <sup>a,b</sup>	2
PHYS 141	General Physics I (Mechanics) <sup>a</sup>	4
PHYS 142	General Physics II (Electricity and Magnetism) (Electricity and Magnetism) <sup>a</sup>	4
MATH 180	Calculus I <sup>a</sup>	4
MATH 181	Calculus II <sup>a</sup>	4
MATH 210	Calculus III <sup>a</sup>	3
MATH 220	Introduction to Differential Equations	3
MATH 310	Applied Linear Algebra	3
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course <sup>c</sup>		3
Understanding the Creative Arts course <sup>c</sup>		3
Understanding the Individual and Society course <sup>c</sup>		4
Understanding the Past course <sup>c</sup>		3
Understanding U.S. Society course <sup>c</sup>		3
BIOS 110	Biology of Cells and Organisms <sup>a</sup>	4
Select one of the following:		3-4
BIOS 220	Genetics	
BIOS 222	Cell Biology	
BIOS 286	The Biology of the Brain	
BIOS 340	Environmental Physiology	

CHEM 232	Structure and Function	
<b>Total Hours</b>		<b>64-65</b>

- 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

Code	Title	Hours
<b>Required Courses</b>		
ENGR 100	Engineering Orientation <sup>a</sup>	1
BME 101	Introduction to Biomedical Engineering	3
BME 102	Biomedical Engineering Freshman Seminar	1
CS 109	Programming for Engineers with MatLab	3
BME 205	Biomedical Engineering Thermodynamics	3
ECE 210	Electrical Circuit Analysis	3
BME 240	Modeling Physiological Data and Systems	3
BME 250	Clinical Problems in Biomedical Engineering	3
CME 260	Properties of Materials	3
BME 325	Biotransport	3
BME 310	Biological Systems Analysis	3
BME 339	Biostatistics I	3
BME 396	Senior Design I	3
BME 397	Senior Design II	3
BME 399	Professional Development for Biomedical Engineers	0
BIOE 430	Bioinstrumentation and Measurements I	3
BIOE 431	Bioinstrumentation and Measurement Laboratory	2
BME 460	Materials in Biomedical Engineering	3
<b>Total Hours</b>		<b>45</b>

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

## Selective Engineering Courses

Code	Title	Hours
<b>Required Courses</b>		
Select one of the following biomedical product development courses:		2-3
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: <sup>a</sup>		2
BME 423	Biomedical Imaging Laboratory	
BME 456	Cell & Tissue Laboratory	
BME 476	Neural Engineering I Laboratory	
BME 481	Bioinformatics Laboratory	
<b>Total Hours</b>		<b>7-8</b>

<sup>a</sup> Students must select a pair of capstone lecture and lab courses (BME 455/BME 456, BME 480/BME 481, BME 421/BME 423) as part of the requirements to complete a Bioengineering Concentration Area.

## Biomedical Engineering Concentration Area Electives

Code	Title	Hours
<b>Electives</b>		<b>12</b>
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 BIOE 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 (BIOE 421, BIOE 455, BIOE 475, BIOE 480) are automatically approved.		
5. A maximum of 6 hours of BIOE 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	
<b>Total Hours</b>		<b>12</b>

## Sample Course Schedule

Course	Title	Hours
<b>Freshman Year</b>		
<b>First Semester</b>		
BME 101	Introduction to Biomedical Engineering	3
ENGR 100	Engineering Orientation <sup>a</sup>	1
MATH 180	Calculus I	4
BIOS 110	Biology of Cells and Organisms	4
CHEM 122	Matter and Energy	3
CHEM 123	Foundations of Chemical Inquiry I	2
<b>Hours</b>		<b>16</b>

### Second Semester

BME 102	Biomedical Engineering Freshman Seminar	1
MATH 181	Calculus II	4
CS 109	Programming for Engineers with MatLab	3
CHEM 124	Chemical Dynamics	3
CHEM 125	Foundations of Chemical Inquiry II	2
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
<b>Hours</b>		<b>16</b>

### Sophomore Year

#### First Semester

PHYS 141	General Physics I (Mechanics)	4
MATH 210	Calculus III	3
BIOS 286	The Biology of the Brain	3
BME 240	Modeling Physiological Data and Systems	3
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
<b>Hours</b>		<b>16</b>

#### Second Semester

BME 250	Clinical Problems in Biomedical Engineering	3
BME 205	Biomedical Engineering Thermodynamics	3
PHYS 142	General Physics II (Electricity and Magnetism)	4
MATH 220	Introduction to Differential Equations	3
MATH 310	Applied Linear Algebra	3
<b>Hours</b>		<b>16</b>

### Junior Year

#### First Semester

BME 310	Biological Systems Analysis	3
BME 325	Biotransport	3
BME 339	Biostatistics I	3
ECE 210	Electrical Circuit Analysis	3
Concentration Area Elective course		3
General Education Core course		3
<b>Hours</b>		<b>18</b>

#### Second Semester

BME 399	Professional Development for Biomedical Engineers	0
BME 402	Medical Technology Assessment	2
BIOE 430	Bioinstrumentation and Measurements I	3
BIOE 431	Bioinstrumentation and Measurement Laboratory	2
CME 260	Properties of Materials	3
Concentration Area Elective course		3
General Education Core course		3
<b>Hours</b>		<b>16</b>

**Senior Year****First Semester**

BME 396	Senior Design I	3
BME 460	Materials in Biomedical Engineering	3
Concentration Area Elective		3
General Education Core courses		4
<b>Hours</b>		<b>13</b>

**Second Semester**

BME 397	Senior Design II	3
Capstone Lecture course		3
Capstone Laboratory course		2
Concentration Area Elective course		3
General Education Core courses		6
<b>Hours</b>		<b>17</b>
<b>Total Hours</b>		<b>128</b>

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