

BS in Biomedical Engineering

Program Requirements

A minimum total of 128-129 credit hours is required for the BS in biomedical engineering program and includes 49 credit hours of major courses that must be completed with a minimum grade point average of 2.000. Prerequisite courses to BME courses must have a grade point average of 2.000. In addition to meeting the requirements of the WSU General Education Program (<http://catalog.wichita.edu/undergraduate/academic-information/general-education-program/>) and the requirements of the College of Engineering, students in the biomedical engineering program must take the following courses:

Course	Title	Hours
General Education (34-35 credit hours)		
Select courses to meet General Education requirements ^{1, 2}		24
General Education courses that will also meet Program Requirements		
PHIL 385 or PHIL 386	Engineering Ethics Biomedical Engineering Ethics	3
CHEM 211	General Chemistry I	5
MATH 242	Calculus I	5
Mathematics/Natural Sciences		
MATH 243	Calculus II	5
MATH 555	Differential Equations I	3
IME 254	Engineering Probability and Statistics I	3
PHYS 313	Physics for Scientists I	4
PHYS 314	Physics for Scientists II	4
BIOL 210	General Biology I	4
BIOL 223	Human Anatomy and Physiology	5
BIOL 420 or CHEM 661	Molecular Cell Biology Principles of Biochemistry	3-4
CHEM 212	General Chemistry II	5
CHEM 533	Elementary Organic Chemistry	3
Major Courses		
AE 223	Statics	3
ECE 282	Circuits I	4
ME 398	Thermodynamics I	3
IME 255	Engineering Economy	3
BME 115	Biomedical Engineering Seminar (taken in the first semester)	0
BME 335	Biomedical Computer Applications	3
BME 452	Biomechanics	3
BME 462	Introduction to Biofluids	3
BME 477	Introduction to Biomaterials	3
BME 480	Bioinstrumentation	3
BME 482	Design of Biodevices	3
BME 585	Capstone Design I	3
BME 595	Capstone Design II	3
Technical Electives		
BME Technical Electives (see technical elective requirements below)		15
Total Credit Hours		128-129

¹ Required major courses may also count towards General Education requirements. Students will need to select additional electives to reach 128-129 credit hours required for graduation with assistance from an advisor.

² See the requirements of the WSU General Education program (<http://catalog.wichita.edu/undergraduate/academic-information/general-education-program/>).

education-program/). Starting in fall 2021, first-year college students must take a First-Year Seminar (FYS) within their first two semesters at WSU. The FYS course should be completed in either fine arts or humanities or social/behavioral sciences.

Technical Elective Requirements

Students must complete 15 credit hours of technical electives, selected from a combination of a **required** BME concentration and the approved list of technical electives. Selection of the 15 credit hours of technical electives must satisfy the following conditions:

- At least 6 of the 15 credit hours must be from a selected BME concentration, and at least one course taken in the BME concentration must be a BME course.
- At least 12 of the 15 credit hours of technical electives must be engineering courses.
- At least 9 of the 15 credit hours must be BME courses.

Course	Title	Hours
BME Concentrations		
Students are required to select one BME concentration, and select a minimum of two courses from the concentration, where one course from the selected concentration must be a BME course		
<i>Biomaterials and Tissue Engineering</i>		
BME 777	Biodegradable Materials	3
BME 779	Tissue Engineering	3
BME 771	Polymer Processing and Technology	3
BME 743	Mechanobiology of Cells and Tissue	3
BME 748	Biomolecular and Cellular Engineering	3
BME 746	Drug Delivery	3
BME 747	Biochemical Engineering	3
BIOL 760	Experimental Molecular Biology Lab	4
<i>Biomechanics and Mechanobiology</i>		
BME 735	Biocomputational Modeling	3
BME 743	Mechanobiology of Cells and Tissue	3
BME 752	Applied Human Biomechanics	3
BME 757	Clinical Biomechanics Instrumentation	3
ME 709	Injury Biomechanics	3
IME 549	Industrial Ergonomics	3
<i>Instrumentation, Sensors and Imaging</i>		
BME 735	Biocomputational Modeling	3
BME 738	Biomedical Imaging	3
BME 758	Biomedical MEMS	3
BME 760A	Brain-Computer Interfaces	3
ME 728	Advanced Electronic Materials	3
<i>Biorobotics and Controls</i>		
BME 722	Introduction to Biorobotics	3
BME 760A	Brain-Computer Interfaces	3
ME 737	Robotics and Control	3
ECE 684	Introductory Control System Concepts	3

Approved Technical Electives

Course	Title	Hours
Aerospace Engineering		
AE 333	Mechanics of Materials	3

AE 373	Dynamics	3
Biological Sciences		
BIOL 760	Experimental Molecular Biology Lab	4
BIOL 773	Statistical Applications in Biology	3
Biomedical Engineering		
BME 722	Introduction to Biorobotics	3
BME 735	Biocomputational Modeling	3
BME 738	Biomedical Imaging	3
BME 743	Mechanobiology of Cells and Tissue	3
BME 747	Biochemical Engineering	3
BME 748	Biomolecular and Cellular Engineering	3
BME 752	Applied Human Biomechanics	3
BME 757	Clinical Biomechanics Instrumentation	3
BME 758	Biomedical MEMS	3
BME 760A	Brain-Computer Interfaces	3
BME 760C	Medical Image Processing	3
BME 746	Drug Delivery	3
BME 771	Polymer Processing and Technology	3
BME 777	Biodegradable Materials	3
BME 779	Tissue Engineering	3
Electrical and Computer Engineering		
ECE 684	Introductory Control System Concepts	3
Industrial, Systems and Manufacturing Engineering		
IME 524	Descriptive Analytics	3
IME 549	Industrial Ergonomics	3
IME 554	Statistical Quality Control	3
IME 557	Safety Engineering	3
IME 561	Applied Control Systems	3
IME 664	Engineering Management	3
IME 749	Ergonomic Assessment Methods	3
IME 759	Ergonomic Interventions	3
IME 761	Robot Programming and Applications	3
IME 764	Systems Engineering and Analysis	3
IME 780AN	Big Data Analytics in Engineering	3
IME 780AP	Neural Networks and Machine Learning	3
Mechanical Engineering		
ME 250	Materials Engineering	3
ME 659	Mechanical Control Systems	3
ME 709	Injury Biomechanics	3
ME 728	Advanced Electronic Materials	3
ME 737	Robotics and Control	3

Premed Students

Curriculum differences for premed students in the biomedical engineering program consist of the following:

1. BIOL 211 is required for premed students;
2. 1-credit-hour labs, PHYS 315 and PHYS 316, must be taken with the 4-credit-hour lecture courses of PHYS 313 and PHYS 314, respectively;

3. CHEM 531 and CHEM 532 are required for biomedical engineering students in the premed curriculum, and will satisfy the biomedical engineering curriculum's organic chemistry requirement.

Biomedical engineering students who are in the premedicine curriculum are encouraged to also meet frequently with the WSU premed advisors to learn about other premed requirements. WSU premed advisors are located in Fairmount College of Liberal Arts and Sciences Advising Center, 115 Grace Wilkie Hall, 316-978-3700.

Applied Learning

Students in the BS in biomedical engineering program are required to complete an applied learning or research experience to graduate from the program. The requirement can be met by successfully completing BME 595 Capstone Design II.