

B.S. in Biomedical Engineering

Catalog Year 2022–23

Below is the *advised sequence* of courses for this degree program on Main Campus as of 7/12/22.

Official degree requirements and course prerequisites are in the University General Catalog; prerequisites are subject to change.

Course Number and Title	Units	Prerequisites/Enrollment Requirements
1st Semester		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
*CHEM 151 Chemical Thinking I or CHEM 161/163	4	Appropriate Math Placement
ENGL 101 or 107 or 109H First-Year Composition	3	
ENGR 102A/B Introduction to Engineering or ENGR 102	3	<u>ENGR102A</u> : MATH 112; <u>ENGR102B</u> : Concurrently enrolled or completion of MATH 122B or 125; FR & SOPH Status
UNIV 101 Intro to the General Education Experience	1	
Semester Total		16/14
2nd Semester		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
*CHEM 152 Chemical Thinking II or CHEM 162/164	4	CHEM 151 or 141/143 or 161/163 and Appropriate Math Placement
*PHYS 141 Introductory Mechanics or PHYS 161H	4	MATH 122B or 125 or Appropriate Math Placement Level
ENGL 102 or 108 First-Year Composition	3	ENGL 101 or ENGL 107
BME 295C Challenges in Biomedical Engineering (Spring only)	1	
General Education: Exploring Perspectives (Artist)	3	
Semester Total		18
3rd Semester		
BE 284 Biosystems Thermal Engineering (Fall only) or AME 230 Thermodynamics (supports ME minor)	3	<u>For BE 284</u> : MATH 129; PHYS 141; <u>For AME 230</u> : PHYS 141 or 161H
BME 214 Introduction Biomechanics (Fall only) or CE 214 Statics	3	For both: PHYS 141; MATH 129;
MATH 223 Vector Calculus	4	MATH 129 with C or better
MCB 181 R Introductory Biology I and MCB 181 L Introductory Biology Laboratory I	3 1	Appropriate Math Placement
BME 225 Intro to Computer Programming for Biomedical Engineering (Fall Only) ECE 175 Computer Programming for Engineering Applications or CSC 250 Essential Computing for the Sciences (CSC Spring Only)	3	<u>For BME 225</u> : CHEM 151 or 141/143 or 161/163, MATH 122B or 125; <u>For ECE 175</u> : Concurrent enrollment or completion of MATH 122B or 125
Semester Total		17
4th Semester		
BME 210 Intermediate Engineering Design: Electronics, Mechanisms, Controllers (Spring only)	3	ECE 175
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 or 223 with C or better
PHYS 241 Introductory Electricity and Magnetism or PHYS 261H	4	For PHYS 241 or 261H: PHYS 141 or 140 or 161H; MATH 129 or Appropriate Math Placement Level
PSIO 201 Human Anatomy and Physiology I	4	
General Education: Exploring Perspectives (Humanist)	3	
Semester Total		17

*Each of the following foundational science courses satisfies the requirements for General Education: Exploring Perspectives (Natural Scientist): CHEM 151 or 152 or 161 or 162; or PHYS 141 or 161H.

Advanced Standing is required for 300- and 400-level engineering courses (see your academic advisor for details).

Course Number and Title	Units	Comments
5th Semester		
BME 447 Sensors and Controls (Fall only)	3	
PSIO 202 Human Anatomy and Physiology II or ECOL 182 R/L Introductory Biology II and Laboratory	4	
BME 376 Biomedical Statistics (Fall only) or DATA 363 Introduction to Statistical Methods	3	
MATH 481 Mathematical Modeling of Fluid Flow through & around Organs and Organisms or BME 331 Introduction to Fluid Mechanics	3	
General Education: Exploring Perspectives (Social Scientist)	3	
Semester Total	16	
6th Semester		
BME 330 Biomedical Instrumentation (Spring Only)	4	
AME 301 Engineering Analysis or MATH 322 Mathematical Analysis for Engineers	3	
BME 480 Translational Biomedical Engineering (Spring only)	3	
BME Technical Elective or BME 310 Medical Device Design (Spring only)	3	9 or more units of BME Tech Elective, Consult major advisor for course approval
†General Education: Building Connections	3	
Semester Total	16	
7th Semester		
ENGR 498A Interdisciplinary Capstone (Fall Only)	3	Senior Status
BME 497G Clinical Rotation (Fall Only)	1	
BME Technical Elective	3	9 or more units of BME Tech Elective, Consult major advisor for course approval
**Technical Elective	3	Consult major advisor for course approval
**Technical Elective	3	Consult major advisor for course approval
†General Education: Building Connections	3	
Semester Total	16	
8th Semester		
ENGR 498B Interdisciplinary Capstone (Spring Only)	3	Senior Status
BME Technical Elective	3	9 or more units of BME Tech Elective, Consult major advisor for course approval
**Technical Elective	3	Consult major advisor for course approval
**Technical Elective	1-3	Depends on selection of General Education course, Consult major advisor for course approval
†General Education: Building Connections	3	
UNIV 301 General Education Portfolio	1	
Semester Total	14/16	

†Students should work closely with their academic advisor to select General Education: Building Connections courses; some course work in the major, such as some Technical Elective courses, may also fulfill General Education: Building Connections requirements.

**Technical Electives: three units of Engineering Technical Electives and 9 units of Technical Electives in consultation with an advisor for a total of 21 units.