

BIOMEDICAL ENGINEERING MAJOR

Major Requirements

Bachelor of Science in Biomedical Engineering

127 credits

Natural Science Requirements

Code	Title	Credits
Select one Biology elective with lab from the following:		
BIOL 1171	General Biology I	4
BIOL 1172	General Biology II	
BIOL 1173	General Biology III	
CHEM 1171 & 1171L	General Chemistry I and General Chemistry I Lab	4
CHEM 1172 & 1172L	General Chemistry II and General Chemistry II Lab	4
CHEM 2271 & 2271L	Organic Chemistry I and Organic Chemistry I Lab	4
MATH 1141	Calculus I for Chemistry, Engineering, and Physics Majors ²	4
MATH 1142	Calculus II for Chemistry, Engineering, and Physics Majors ²	4
MATH 2243	Calculus III for Chemistry, Engineering, and Physics Majors	4
MATH 2251	Ordinary Differential Equations	3
PHYS 1171 & 1171L	General Physics I and General Physics I Lab ²	4
PHYS 1172 & 1172L	General Physics II and General Physics II Lab ²	4
Total Credits		39

Major Requirements

For a major in Biomedical Engineering, students complete the following:

Code	Title	Credits
Engineering Foundation		
CPEG 2245	Digital Design I	3
CPEG 2245L	Digital Design I Lab	1
CPSC 1131	Fundamentals of Programming	3
ELEG 2213	Introduction to Electric Circuits	3
ELEG 2213L	Electric Circuits Lab	1
ELEG 3348	Embedded Microcontrollers	3
ELEG 3348L	Embedded Microcontrollers Lab	1
ENGR 1031	Fundamentals of Engineering	3
ENGR 2130	Engineering Graphics I	3
ENGR 2145	Mathematical Analysis	3
MEEG 2207	Materials Science	3
Biomedical Engineering Depth		
BIEG 3201	Biomechanics	3

BIEG 3301	Biomedical Instrumentation	4
BIEG 3331	Biomedical Signal Processing	3
BIEG 4332	Biomedical Imaging	3
BIEG 4350	Medical Device Design	3
ENGR 4961	Senior Design Project I	3
ENGR 4962	Senior Design Project II	3
Select two biomedical major electives with approval of advisor ¹		6
Total Credits		55

¹ The premed option requires BIOL 3324 Biochemistry I as one of the biomedical electives.

² Fulfills *Magis* Core requirement

Magis Core Requirements

Magis Core Relationship to the Biomedical Engineering Major

In addition to the engineering-specific major requirements, students are required to fulfill the University's *Magis* Core requirements. The following table relates the *Magis* Core requirements to the Biomedical Engineering program.

Tier I: Orientation

Code	Title	Credits
English		
ENGL 1001	Introduction to Rhetoric and Composition	3
History		
Select one HIST 1000-level course or CLST 1115 or CLST 1116		3
Mathematics		
MATH 1141	Calculus I for Chemistry, Engineering, and Physics Majors	4
Modern or Classical Language		
Select one language course based on placement ¹		3
Philosophy		
PHIL 1101	Introduction to Philosophy	3
Religious Studies		
Select one RLST 1000-level course		3
Modern/Classical Language or Mathematics		
MATH 1142	Calculus II for Chemistry, Engineering, and Physics Majors	4
Total Credits		23

¹ If starting a new language, a placement exam is not necessary.

Tier II: Exploration

Code	Title	Credits
Behavioral and Social Sciences		
Select two courses from the following fields:		6
	Communication	
	Economics	
	Politics	

Psychology (except PSYC 1610)	
Sociology and Anthropology (except ANTH 1200 and ANTH 1210)	
History, Philosophy, Religious Studies	
Select two 2000- or 3000-level courses from two different disciplines	6
Literature	
Select one course from the following fields:	3
Classics	
English	
Modern Languages and Literatures	
Natural Sciences	
PHYS 1171 General Physics I & 1171L and General Physics I Lab	4
PHYS 1172 General Physics II & 1172L and General Physics II Lab	4
Visual and Performing Arts	
Select one 1000-level course from the following fields in Visual and Performing Arts:	3
Art History and Visual Culture	
Film, Television, and Media Arts	
Music	
Studio Art	
Theatre	
Total Credits	26

Plan of Study

A typical, full-time, four-year plan of study appears below. Some variation may be possible. Students should always discuss their individual plan of study with their advisor prior to registering for courses.

Course	Title	Credits
First Year		
Fall		
ENGR 1031	Fundamentals of Engineering	3
MATH 1141	Calculus I for Chemistry, Engineering, and Physics Majors	4
PHYS 1171	General Physics I	3
PHYS 1171L	General Physics I Lab	1
Modern/Classical Language Orientation Tier ⁵		3
History Orientation Tier ¹		3
Credits		17
Spring		
CPSC 1131	Fundamentals of Programming	3
ENGL 1001	Introduction to Rhetoric and Composition	3
MATH 1142	Calculus II for Chemistry, Engineering, and Physics Majors	4
PHYS 1172	General Physics II	3
PHYS 1172L	General Physics II Lab	1
ENGR 2130	Engineering Graphics I	3
Credits		17

Second Year		
Fall		
BIEG 3201	Biomechanics	3
ELEG 2213	Introduction to Electric Circuits	3
ELEG 2213L	Electric Circuits Lab	1
MATH 2243	Calculus III for Chemistry, Engineering, and Physics Majors	4
CHEM 1171	General Chemistry I	3
CHEM 1171L	General Chemistry I Lab	1
Credits		15

Spring		
BIEG 3301	Biomedical Instrumentation	4
ENGR 2145	Mathematical Analysis	3
ENGR 2145P	Mathematical Analysis PLG	0
MATH 2251	Ordinary Differential Equations	3
CHEM 1172	General Chemistry II	3
CHEM 1172L	General Chemistry II Lab	1
PHIL 1101	Introduction to Philosophy	3
Credits		17

Third Year		
Fall		
CHEM 2271	Organic Chemistry I	3
CHEM 2271L	Organic Chemistry I Lab	1
BIEG 3331	Biomedical Signal Processing	3
MEEG 2207	Materials Science	3
Religious Studies Orientation Tier ¹		3
Behavioral and Social Sciences Exploration Tier ³		3
Credits		16

Spring		
BIEG 4332	Biomedical Imaging	3
CPEG 2245	Digital Design I	3
CPEG 2245L	Digital Design I Lab	1
History or Philosophy or Religious Studies Exploration Tier ²		3
Select one Biology course with lab from the following: ⁸		4
BIOL 1171	General Biology I (or)	
BIOL 1172	General Biology II (or)	
BIOL 1173	General Biology III	
Credits		14

Fourth Year		
Fall		
ENGR 4961	Senior Design Project I	3
BIEG 4350	Medical Device Design	3
Major Elective ⁴		3
ELEG 3348	Embedded Microcontrollers	3
ELEG 3348L	Embedded Microcontrollers Lab	1
History or Philosophy or Religious Studies Exploration Tier ²		3
Credits		16

Spring		
ENGR 4962	Senior Design Project II	3
Major Elective ⁴		3
Behavioral and Social Sciences Exploration Tier ²		3
Visual and Performing Arts Exploration Tier ⁶		3

Literature Exploration Tier ⁷	3
Credits	15
Total Credits	127

¹ Choose an appropriate History or Religious Studies course at the 1000 level

² Choose any appropriate Religious Studies, History, or Philosophy core course

³ Core Social Science course may be filled by appropriate courses in Communication, Economics, Psychology, Politics, or Sociology and Anthropology.

⁴ Major electives are chosen from the department, but may be chosen with approval of advisor and department chair from among other courses offered in the School of Engineering.

⁵ Choose any Language offered by the Modern Language Department, based on placement exam.

⁶ Visual and Performing Art History courses may be chosen from Art History, Music, Film, Television, and Media Arts, Studio Art, or Theatre.

⁷ Approved English, Modern Languages and Literatures, and Classics courses.

⁸ Corequisite lab is required.