

BIOMEDICAL ENGINEERING (B.S.)

Objectives

Graduates of the Biomedical Engineering program will be able to achieve the following three objectives within the first few years after graduation:

1. Employed in the biomedical engineering profession with potential for successful career advancement.
2. For those with an interest in earning advanced degrees, they will have completed or be pursuing advanced degrees.
3. Be informed and involved members of their communities as well as professional organizations and engaged in life-long learning.

Note: Students are required to take the Mathematics Placement Test to determine if they need to take any math courses before taking MATH 241 CALCULUS I WITH LABORATORY.

Major Requirements

Code	Title	Hours
MATH 241	CALCULUS I WITH LABORATORY	3
MATH 242	CALCULUS II WITH LABORATORY	3
MATH 243	CALCULUS III WITH LABORATORY	3
MATH 244	CALCULUS IV WITH LABORATORY	3
MATH 307	PROBLY & STATISTICS/ENGINEERG	3
MATH 368	DIFFERENTIAL EQUATIONS	3
CHEM 141 & CHML 141	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB	4
CHEM 142 & CHML 142	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LAB	4
CHEM 241 & CHML 241	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY I LAB	4
PHY 211 & PHYL 211	General Physics I and GENERAL PHYSICS LAB I	4
PHY 212 & PHYL 212	General Physics II and GENERAL PHYSICS LAB II	4
BIO 111 & BIOL 111	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
BIO 112 & BIOL 112	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
BIO 440 & BIOL 440	CELL BIOLOGY and CELL BIOLOGY LAB	4
BIO 470 & BIOL 470	HUMAN PHYSIOLOGY and HUMAN PHYSIOLOGY LAB	4
CSC 118	COMPUTER SCIENCE I	3
ECE 212 & ECEL 212	DIGITAL LOGIC and DIGITAL LOGIC LABORATORY	4
ECE 220 & ECEL 220	CIRCUIT THEORY and CIRCUITS LABORATORY	4
CIV 222	ENGINEERING MECHANICS I	3
ECE 312	COMPUTER ORGANIZATION & DESIGN	3
ECE 360 & ECEL 360	EMBEDDED MICROPROCESSOR SYSTEM and MICROPROCESSOR LABORATORY	4
ECE 490	SENIOR DESIGN PROJECTS I	3

ECE 491	SENIOR DESIGN PROJECTS II	3
Total Hours		81

Technical Electives for Biomedical Engineering Majors

Code	Title	Hours
BIO 318	INTRODUCTORY GENETICS	3
BIO 393	INTRO TO MEDICAL TERMINOLOGY	3
ECE 355	CONTROL SYSTEMS	3
ECE 451	DIGITAL SIGNAL PROCESSING	3
ECE 493	SPCL TPCS N ELECTRL & COMPU EN	3
Other Courses require Chair's approval		

Curriculum Map

Course	Title	Hours
Freshman		
Fall		
BIO 111 & BIOL 111	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
ENG 104 or ENG 103 or ENG 111	COMPOSITION I or English Composition I with Co-requisite Support or COMPOSITION & LITERATURE FOR L	3
MATH 241	CALCULUS I WITH LABORATORY	3
UNIV 100	UNIVERSITY SUCCESS	2
Humanities & Fine Arts Option		3
Hours		15
Spring		
CHEM 141 & CHML 141	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB	4
ENG 105 or ENG 112	COMPOSITION II or COMPOSITION	3
ECE 212 & ECEL 212	DIGITAL LOGIC and DIGITAL LOGIC LABORATORY	4
MATH 242	CALCULUS II WITH LABORATORY	3
Pathway Option		3
Hours		17
Sophomore		
Fall		
BIO 112 & BIOL 112	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
CSC 118	COMPUTER SCIENCE I	3
MATH 243	CALCULUS III WITH LABORATORY	3
PHY 211 & PHYL 211	General Physics I and GENERAL PHYSICS LAB I	4
Pathway Option		3
Hours		17
Spring		
PHY 212 & PHYL 212	General Physics II and GENERAL PHYSICS LAB II	4
ECE 220 & ECEL 220	CIRCUIT THEORY and CIRCUITS LABORATORY	4
MATH 244	CALCULUS IV WITH LABORATORY	3
UNIV 200	CIVIC ENGAGEMENT	1
Pathway Option		3
Hours		15
Junior		
Fall		
BIO 470 & BIOL 470	HUMAN PHYSIOLOGY and HUMAN PHYSIOLOGY LAB	4

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CHEM 142 & CHML 142	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LAB	4
ECE 312	COMPUTER ORGANIZATION & DESIGN	3
MATH 368	DIFFERENTIAL EQUATIONS	3
ECE 471 Biomedical Signal Processing		3
Hours		17
Spring		
CHEM 241 & CHML 241	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY I LAB	4
CIV 222	ENGINEERING MECHANICS I	3
ECE 360 & ECEL 360	EMBEDDED MICROPROCESSOR SYSTEM and MICROPROCESSOR LABORATORY	4
Humanities & Fine Arts Option		3
ECE 472 Biomedical Materials		3
Hours		17
Senior		
Fall		
BIO 440 & BIOL 440	CELL BIOLOGY and CELL BIOLOGY LAB	4
ECE 490	SENIOR DESIGN PROJECTS I	3
ECE 470 Biomedical Instrumentation		3
MATH 307	PROBLYTY & STATISTICS/ENGINEERG	3
Social & Behavioral Science Option		3
Hours		16
Spring		
Technical Elective I		3
ECE 491	SENIOR DESIGN PROJECTS II	3
Technical Elective II		3
Technical Elective III		3
Hours		12
Total Hours		126

Notes:

- Candidates that transfer 12 or more hours of college credit are exempt from UNIV 100 UNIVERSITY SUCCESS; however, the student must take 2 hours of general electives to replace the UNIV course.
- Online Graduation Clearance (**to be completed during the graduating semester only**).

Code	Title	Hours
Technical Electives		
BIO 318	INTRODUCTORY GENETICS	3
BIOL 318	INTRODUCTORY GENETICS LAB	1
BIO 393	INTRO TO MEDICAL TERMINOLOGY	3
ECE 355	CONTROL SYSTEMS	3
ECE 451	DIGITAL SIGNAL PROCESSING	3
ECE 493	SPCL TPCS N ELECTRL & COMPU EN	1-4
Other courses require Chair's approval		
Total Hours		14-17

1. Students who transfer 12 or more hours of college credit are exempt from UNIV 100 UNIVERSITY SUCCESS .
2. Students are required to take the Mathematics Placement Test to determine if they need to take any math courses before taking MATH 241 CALCULUS I WITH LABORATORY (C).

Student Learning Outcomes

Each student who graduates from the Undergraduate Program in Biomedical Engineering will have:

1. An ability to identify, formulate, and solve complex Biomedical engineering problems by applying principles of Biomedical engineering, science, and mathematics
2. An ability to apply Biomedical engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in Biomedical engineering situations and make informed judgments, which must consider the impact of Biomedical engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use Biomedical engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.