

Biomedical Engineering: Premedical, B.S.

Program Educational Objectives: Graduates of the Biomedical Engineering: Premedical program will: (1) demonstrate a broad knowledge in the field of biomedical engineering; (2) demonstrate critical reasoning as well as quantitative skills to identify, formulate, analyze and solve biomedical problems; (3) qualify to pursue entry into a medical college, or medical research in biomedical engineering, or other professional health programs. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.) The major program objective is to prepare students for medical school. The curriculum is designed to meet the requirements for admission to medical schools, but is also suitable for those planning to enter graduate school in biomedical engineering, physiology, biology, neurosciences, or related fields. It has less engineering content and more biological sciences than the accompanying Biomedical Engineering major. It is one of many majors that can serve as preparation for further training in medical, veterinary, or allied health professions.

The Biomedical Engineering: Premedical curriculum provides future physicians with a quantitative background in biomechanics, physiology, and biotransport. Such a background is increasingly important because of the heavy utilization of biomedical technology in modern medical practice. The curriculum includes courses in the sciences that satisfy the requirements of most medical schools.

High School Students: See School admissions (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#undergraduatestudytext>) information.

Transfer Students: Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, one year of general chemistry (with laboratory), one year of organic chemistry (with laboratory), and one course in introductory programming. For course equivalency specific to each college, see assist.org (<https://assist.org>).

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

All students must meet the University Requirements (<http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/>).

All students must meet the School Requirements (<http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#schoolrequirements>).

Major Requirements

Mathematics and Basic Science Courses:	
Students must complete a minimum of 48 units of mathematics and basic sciences including:	
CHEM 1A- 1B- 1C	General Chemistry and General Chemistry and General Chemistry
CHEM 1LC- 1LD	General Chemistry Laboratory and General Chemistry Laboratory
CHEM 51A- 51B- 51C	Organic Chemistry and Organic Chemistry and Organic Chemistry
CHEM 51LB- 51LC	Organic Chemistry Laboratory and Organic Chemistry Laboratory
MATH 2A- 2B	Single-Variable Calculus I and Single-Variable Calculus II
MATH 2D	Multivariable Calculus I
MATH 3A	Introduction to Linear Algebra
MATH 3D	Elementary Differential Equations
PHYSICS 7C	Classical Physics
PHYSICS 7LC	Classical Physics Laboratory
PHYSICS 7D- 7E	Classical Physics and Classical Physics
PHYSICS 7LD	Classical Physics Laboratory
Students select, with the approval of a faculty advisor, any additional basic science course needed to satisfy school and major requirements.	
Engineering Topics Courses:	
Students must complete the following engineering topics including:	
BIO SCI 97	Genetics

BIO SCI 98	Biochemistry
BIO SCI 99	Molecular Biology
BIO SCI 100	Scientific Writing
BIO SCI D103	Cell Biology
or BIO SCI D104	Developmental Biology
BIO SCI D111L	Developmental and Cell Biology Laboratory
BIO SCI E112L- M114L- M116L	Physiology Laboratory and Biochemistry Laboratory and Molecular Biology Laboratory (select two of these three courses)
BME 1	Introduction to Biomedical Engineering
BME 60A- 60B- 60C	Engineering Analysis/Design: Data Acquisition and Engineering Analysis/Design: Data Analysis and Engineering Analysis/Design: Computer-Aided Design
BME 110A- 110B	Biomechanics I and Biomechanics II
BME 111	Design of Biomaterials
BME 120	Sensory Motor Systems
BME 121	Quantitative Physiology: Organ Transport Systems
BME 130	Biomedical Signals and Systems
BME 150	Biotransport Phenomena
Students select, with the approval of a faculty advisor, at least three additional engineering topics courses needed to satisfy school and major requirements.	

(The nominal Biomedical Engineering: Premedical program will require 194 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

Optional Specialization in Biophotonics

Select three of the following:	
BME 135	Photomedicine
BME 136	Engineering Medical Optics
BME 137	Introduction to Biomedical Imaging
BME 138	Spectroscopy and Imaging of Biological Systems
EECS 180A	Engineering Electromagnetics I

Completion of this specialization also satisfies the Engineering electives requirement.

Optional Specialization in Micro and Nano Biomedical Engineering

Select three of the following:	
BME 142	Microfabrication
BME 147	Microfluidics and Lab-on-a-Chip
BME 148	Microimplants
MSE 141	Nano-Scale Materials and Applications
ENGRMAE 153	Advanced BIOMEMS Manufacturing Techniques

Completion of this specialization also satisfies the Engineering electives requirement.

The sample program of study chart shown is typical for the major in Biomedical Engineering: Premedical. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Biomedical Engineering: Premedical majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

Freshman

Fall	Winter	Spring
MATH 2A	MATH 2B	MATH 2D
CHEM 1A	CHEM 1B	CHEM 1C

BME 1 General Education	PHYSICS 7C PHYSICS 7LC General Education	CHEM 1LC PHYSICS 7D PHYSICS 7LD
Sophomore		
Fall	Winter	Spring
MATH 3A	MATH 3D	CHEM 51C
CHEM 1LD	CHEM 51B	CHEM 51LC
CHEM 51A	CHEM 51LB	BME 60C
PHYSICS 7E	BME 60B	General Education
BME 60A	General Education	General Education
Junior		
Fall	Winter	Spring
BIO SCI 97	BIO SCI 98	BIO SCI 99
BME 110A	BME 110B	BME 111
BME 120	BME 150	BME 121
BME 130	Engineering Elective	General Education
Senior		
Fall	Winter	Spring
BIO SCI 100	BIO SCI D103 or D104	BIO SCI E112L ¹
General Education	BIO SCI D111L	BIO SCI M114L ¹
General Education	Engineering Elective	BIO SCI M116L ¹
	General Education	Engineering Elective

¹ Select two of BIO SCI E112L, BIO SCI M114L, BIO SCI M116L.

- Biomedical Engineering, B.S.
- Biomedical Engineering, M.S.
- Biomedical Engineering, Minor
- Biomedical Engineering, Ph.D.