

BIOMEDICAL ENGINEERING (BSE)

Bachelor of Science in Engineering

Biomedical Engineering majors may pursue one of the following four tracks: Biomaterials and Tissue Engineering, Computational and Systems Biology, Biomechanics and Mechanobiology, or Systems, Imaging and Instrumentation.

Requirements

The Biomedical Engineering major requires a total of 128 credits. All Biomedical Engineering majors are required to complete the following:

Course	Title	Credits
BIOL 1107	Principles of Biology I	4
BME 3120	LabVIEW Basics for Engineers	1
BME 3900	Junior Design	3
BME 4900	Biomedical Engineering Design I	3
BME 4910W	Biomedical Engineering Design II	3
CHEM 1128Q or CHEM 1148Q	General Chemistry II Honors General Chemistry II	4
CE 2110	Applied Mechanics I	3
ECE 2001	Electrical Circuits	4
ENGR 1166	Foundations of Engineering	3
Select one of the following:		4
MATH 2110Q	Multivariable Calculus	
MATH 2130Q	Honors Multivariable Calculus	
MATH 2143Q	Advanced Calculus III	
MATH 2210Q	Applied Linear Algebra	3
Select one of the following:		3-4
MATH 2410Q	Elementary Differential Equations	
MATH 2420Q	Honors Differential Equations	
MATH 2144Q	Advanced Calculus IV	
MSE 2001 or MSE 2101	Introduction to Structure, Properties, and Processing of Materials I Materials Science and Engineering I	3
PNB 2264 or PNB 2274	Human Physiology and Anatomy Enhanced Human Physiology and Anatomy	4
BME electives (taken from designated list of BME courses for each track)		6
Total Credits		51-52

Tracks

Biomaterials and Tissue Engineering

Course	Title	Credits
BME 3400 or ECE 3101	Biosystem Analysis Signals and Systems	3
BME 3500	Biomedical Engineering Measurements	4
BME 3600	Biomechanics	4
BME 3700	Biomaterials	4
BME 4710	Tissue Engineering	3
CHEM 3563	Physical Chemistry I	3

ENGR 3400 or STAT 3025Q	Engineering Data Analysis Techniques Statistical Methods	3
MCB 2210	Cell Biology	3
Track Elective (from the Track Elective list for Biomaterials and Tissue Engineering)		3
Elective (from BME or Track Elective list for Biomaterials and Tissue Engineering)		3
Total Credits		33

Computational and Systems Biology

Course	Title	Credits
BME 3400 or ECE 3101	Biosystem Analysis Signals and Systems	3
BME 3401 or CSE 3810	Introduction to Computational and Systems Biology Computational Genomics	3
BME 4400 or BME 3100	Dynamical Modeling of Biological Networks Physiological Modeling	3
BME 4401 or BME 4810	Computational Foundations of Systems Biology Machine Learning Methods for Biomedical Signal Analysis	3
CSE 1729	Introduction to Principles of Programming	3
MCB 2210	Cell Biology	3
MCB 2400 or MCB 2410	Human Genetics Genetics	3
STAT 3025Q	Statistical Methods	3
STAT 3965 or MATH 3170	Elementary Stochastic Processes Elementary Stochastic Processes	3
Track Electives (from the Track Elective list for Computational and Systems Biology)		6
Total Credits		33

Biomechanics and Mechanobiology

Course	Title	Credits
BME 3600	Biomechanics	4
BME 3620	Failure Analysis for Biomedical Application	3
CE 2120	Applied Mechanics II	3
CE 3110	Mechanics of Materials	3
ENGR 3400 or STAT 3025Q	Engineering Data Analysis Techniques Statistical Methods	3
ME 2233	Thermodynamic Principles	3
ME 3227 or ME 3255	Design of Machine Elements Computational Mechanics	3
ME 3250	Fluid Dynamics I	3
Track Electives (from the Track Elective list for Biomechanics and Mechanobiology)		6
Elective (from BME or Track Elective list for Biomechanics and Mechanobiology)		3
Total Credits		34

Systems, Imaging and Instrumentation

Course	Title	Credits
BME 3400	Biosystem Analysis	3
or ECE 3101	Signals and Systems	
BME 3500	Biomedical Engineering Measurements	4
BME 4201	Introduction to Medical Imaging	3
BME 4500	Bioinstrumentation	3
ECE 3111	Systems Analysis and Design	4
ECE 3201	Electronic Circuit Design and Analysis	4
or CSE 2301	Principles and Practice of Digital Logic Design	
STAT 3025Q	Statistical Methods	3
STAT 3965	Elementary Stochastic Processes	3
or MATH 3170	Elementary Stochastic Processes	
Track Elective (from the Track Elective list for Systems, Imaging and Instrumentation)		3
Elective (from BME or Track Elective list for Systems, Imaging and Instrumentation)		3
Total Credits		33

Additional Notes

No more than three credits of independent study (BME 4999 Independent Study) can count toward the 6-9 credits of BME electives.

The professional requirements and electives are specified in the *Biomedical Engineering Guide to Course Selection* www.bme.uconn.edu (<https://www.bme.uconn.edu/>).

The Biomedical Engineering undergraduate program educational objectives are that our alumni/ae: will be engaged in professional practice as engineers and/or scientists in occupational settings primarily involving human health and well-being; will advance in their professional careers; and will engage in professional development, or post-graduate education, to continuing their self-development in biomedical engineering or other related fields.

The Biomedical Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org. (<https://www.abet.org/>)

University General Education Requirements

Every student must meet a set of core requirements to earn a baccalaureate degree, in addition to those required by the student's major course of study and other requirements set by the student's school or college. For more information about these requirements, please see General Education Requirements (<https://catalog.uconn.edu/undergraduate/gen-ed-requirements/>).

College of Engineering Degree Requirements

Students must meet a set of requirements established by the college in addition to the University's General Education requirements. For more information, see the College of Engineering (<https://catalog.uconn.edu/undergraduate/engineering/#requirementstext>) section of this catalog.