

BIOMEDICAL ENGINEERING B.S.BME.

The B.S. in Biomedical Engineering trains engineers to work at the interface between engineering and the biomedical sciences. The curriculum is structured into three phases: Foundational, Skills, and Specialization.

In the Foundational Phase, students take courses in math and science to build a solid foundation in quantitative engineering methods and biomedical science, and to expose them to the opportunities in biomedical engineering. In the BME Skills Phase, students develop the breadth of engineering skills needed to address the multidisciplinary nature of biomedical engineering. This phase is complemented by a multi-semester design sequence. In the final three semesters, Specialization Phase, students pursue electives germane to their interests and have their Capstone Design Experience.

The B.S. in Biomedical Engineering leverages strong ties between UVM's College of Engineering & Mathematical Sciences and its Larner College of Medicine. This collaboration provides students unique biomedical opportunities in a professional setting.

BIOMEDICAL ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES

The educational objectives of the Biomedical Engineering program are to provide our graduates with disciplinary breadth and depth to fulfill complex professional and societal expectations by:

1. Pursuing careers as practicing engineers or using their program knowledge in a wide range of other professional, educational and service activities;
2. Assuming leadership roles and seeking continuous professional development;
3. Contributing to their profession and society while appreciating the importance of ethical and sustainable solutions that benefit all.

REQUIREMENTS

THE CURRICULUM FOR THE B.S. IN BIOMEDICAL ENGINEERING

All students must meet the Degree and University Requirements.

All students must meet the Catamount Core Curriculum Requirements.

All students must meet the College Requirements.

Note that the University's Quantitative and Data Literacy (QD), Natural Sciences (both N1 and N2), Mathematics (MA), and Oral Communication (OC) requirements are built into the Biomedical Engineering curriculum. A minimum of 127 credits are required.

Requirement Description		Credits
GENERAL EDUCATION REQUIREMENTS (21 Credits)		
University WIL: Writing & Information Literacy		3
University D1: Diversity 1		3
University D1/D2: Diversity 1 or Diversity 2		3
University AH1/AH2/AH3: Arts and Humanities		6
University S1: Social Sciences		6
COMPUTING & MATHEMATICS REQUIREMENTS (22 Credits)		
CS 1210	Computer Programming I	3
MATH 1234	Calculus I	4
MATH 1248	Calculus II	4
MATH 2248	Calculus III	4
MATH 2500	Eng Math Linear Algebra Lab	1
MATH 3201	Adv Engineering Mathematics	3
STAT 2430	Statistics for Engineering	3
GENERAL ENGINEERING & SCIENCE REQUIREMENTS (37-38 Credits)		
ENGR 1020	Graphical Communication	2
EE 2155	Electricity & Optics	4
CEE 1100	Statics	3
CEMS 1500	CEMS First Year Seminar ¹	1
ANPS 1190	Ugr Hum Anatomy & Physiology 1	4
ANPS 1200	Ugr Hum Anatomy & Physiology 2	4
BHSC 1340	Human Cell Biology	4
PHYS 1500	Physics for Engineers I	4
CHEM 1400	General Chemistry 1	4
CHEM 1450	General Chemistry 2	4
CHEM 1582	Intro Organic Chemistry	3-4
or CHEM 2580	Organic Chemistry 1	
BIOMEDICAL ENGINEERING COURSE REQUIREMENTS (31 Credits)		
BME 1605	Design 1: Intro to Design	3
BME 2170	Biomechanics	3
BME 2605	Design 2: Regulatory & Testing	3
BME 2650	BME Design 2	1
BME 3205	Biomechanics Lab	3

BME 3255	Biomaterials & Transport Lab	3
BME 3130	Biomaterials	3
BME 3150	Biotransport	3
BME 3175	Biomed Data & Signal Analysis	4
BME 3605	Design 3: BME Capstone I ²	3
BME 4605	Design 4: BME Capstone II	3
BIOMEDICAL ENGINEERING AND SPECIALIZATION ELECTIVES (18 Credits)		
Specialization 1 ³		3
Specialization 2 ⁴		3
Specialization 3 ⁵		3
Engineering Electives ⁶		3
BME Electives ⁷		6
TOTAL		129-130
Optional/Recommended Courses		1
PHYS 1510	Physics Problem Solving I	1

¹ The First Year Seminar CEMS 1500 is designed for all first-year students in the College. Students entering the College after their first semester should work with their academic advisor to identify an appropriate substitution as approved for their major. The course used to fulfill the CEMS 1500 requirement cannot be used to fulfill another requirement in the major.

² Satisfies CEMS Professional Development requirement.

³ Specialization 1: Any 3 credits at the 1000-level or above of BCOR, BHSC, BIOC, BIOL, BME, CEE, CEMS, CHEM, CMPE, COMU, CS, EE, EMGT, ENGR, ENSC, EXSC, HLTH, HSCI, MATH, ME, MLS, MMG, NSCI, PHRM, PHYS, RADT, or STAT. Other courses may be approved by the BME Undergraduate Program Director.

⁴ Specialization 2: Any 3 credits at the 2000-level or above of BCOR, BHSC, BIOC, BIOL, BME, CEE, CEMS, CHEM, CMPE, COMU, CS, EE, EMGT, ENGR, ENSC, EXSC, HLTH, HSCI, MATH, ME, MLS, MMG, NSCI, PHRM, PHYS, RADT, or STAT. Other courses may be approved by the BME Undergraduate Program Director.

⁵ Specialization 3: Any 3 credits at the 3000-level or above of BCOR, BHSC, BIOC, BIOL, BME, CEE, CEMS, CHEM, CMPE, COMU, CS, EE, EMGT, ENGR, ENSC, EXSC, HLTH, HSCI, MATH, ME, MLS, MMG, NSCI, PHRM, PHYS, RADT, or STAT. Other courses may be approved by the BME Undergraduate Program Director.

⁶ Any 3 credits at the 1000-level or above BME, CEE, EE, ENGR, EMGT, ME, CMPE, or CS.

⁷ Any 6 credits at the 3000-level or above of BME.