

## PROGRAM OVERVIEW

Bioengineering is a highly interdisciplinary field that combines the mathematical and physical sciences with engineering principles to study biology, physiology, medicine, behavior and health. Bioengineering is emerging as the leading discipline at the interface of clinical sciences, basic research, and engineering and maintains focus on catalyzing technology to cure and prevent disease. The undergraduate bioengineering program provides training at both the Denver campus and the Anschutz Medical Campus.

The BS Bioengineering program emphasizes the professional competencies of leadership, communication, presentation and critical problem solving. These learning goals and the dual-campus model provide robust training for a variety of careers in the fast-growing biomedical and biotechnology industry. Graduates will also have an excellent foundation for continued education in science, engineering and medicine.

## ACADEMIC ADVISING

Students admitted to the College of Engineering, Design and Computing (CEDC) who have declared a major are required to meet with an advisor in their specific department and should contact that department to schedule an appointment. For Bioengineering academic advising, please contact the Bioengineering Undergraduate Program Manager:

Shaun Boulter  
[shaun.boulter@ucdenver.edu](mailto:shaun.boulter@ucdenver.edu)  
 303-315-7576  
 North Classroom 2516B (Auraria Campus)

For General Information:  
 College of Engineering, Design and Computing  
[engineering@ucdenver.edu](mailto:engineering@ucdenver.edu)  
 303-315-7170

### Bioengineering

[bioengineering@ucdenver.edu](mailto:bioengineering@ucdenver.edu)

Visit the Bioengineering website [here](#)

## GENERAL GRADUATION REQUIREMENTS & POLICIES

All CU Denver BIOE students are required to complete the following minimum general graduation requirements:

1. Complete a minimum of 128 semester hours
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete all college and major requirements
4. Residency: complete a minimum of 30 CEDC hours as a declared CEDC student in good standing at CU Denver
5. Terminal Residency: complete at least the final two semesters as an enrolled CEDC student

## PROGRAM REQUIREMENTS & POLICIES

**Students are responsible for meeting with their advisor in their department to confirm major requirements.** Students completing the Bioengineering B.S. Degree are required to complete the following minimum program requirements:

1. Complete 24 semester hours of CU Denver Core Curriculum coursework.
2. Complete a minimum of 58 semester hours of BIOE Downtown coursework with a grade of C – or better and a 2.0 GPA or higher.
3. Complete a minimum of 46 semester hours of upper-division bioengineering coursework, including 12 semester hours of approved technical electives with a grade of C- or higher in each course. All upper-division bioengineering courses are taught at the Anschutz Medical Campus (AMC). Of the twelve technical elective hours, a minimum of 9 credit hours must be taught within the Department of Bioengineering.

Courses	Credits	Notes
<b>* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *</b>		
<b>Required CU Denver Core Curriculum Coursework</b>	<b>24</b>	<a href="#">CU Denver Core Curriculum</a>
<b>Required BIOE Downtown Coursework</b>	<b>58</b>	
MATH1401 Calculus I	4	*Prerequisite: Placement; fulfills CORE Mathematics
MATH2411 Calculus II	4	*Prerequisite: C- or better in MATH1401
MATH2421 Calculus III	4	*Prerequisite: C- or better in MATH2411
MATH3195 Linear Algebra and Differential Equations	4	*Prerequisite: C- or better in MATH2411
BIOL 2051 & 2071 General Biology I with lab	4	*Prerequisite: High School chemistry or CHEM 1000 recommended
BIOL 2061 & 2081 General Biology II with lab	4	*Prerequisite: General BIOL I with lab with grade of C- or higher
CHEM 2031 & 2038 General Chemistry I with lab	4	*Prerequisite: High School chemistry or CHEM 1000 recommended
CHEM 2061 & 2068 General Chemistry I with lab	5	*Prerequisite: General CHEM I with lab with grade of C- or higher
CHEM 3411 & 3418 Organic Chemistry I with lab	5	*Prerequisite: General CHEM I & II with labs with min. grades of C-
PHYS 2311 & 2321 General Physics I with lab	5	*Prerequisite: MATH1401
PHYS 2331 & 2341 General Physics II with lab	5	*Prerequisite: PHYS 2311 and MATH 2411
ENGR 1200 Fundamentals of Engineering Design Innovation	3	
BIOE1020 Bioengineering Design and Prototyping II	3	*Prerequisite: C- or better in MATH2411 (recommended)

Courses	Credits	Notes
<b>* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *</b>		
<b>Required BIOE Pre-major Coursework (Continued)</b>		
BIOE2010 Introduction to Programming for Bioengineers	2	*Prerequisite: C- or better in MATH 1401 and
BIOE2020 Introduction to Computational Methods for Bioengineers	2	*Prerequisite: C- or better in MATH 2411
<b>Required BIOE Upper-Division Coursework (Taught at AMC)</b>		
		<b>46</b>
Students must be admitted into the Bioengineering major (BIOE-BS) on the Anschutz Medical Campus in order to enroll in all upper-division BIOE courses.		
BIOE3010 Bioinstrumentation	3	
BIOE3020 Introduction to Biomechanical Analysis	3	* Prerequisite: MATH 1401, 2411 and 3195 or equivalent
BIOE3030 Introduction to Biomaterials	3	* Prerequisite: CHEM 3411 with lab or equivalent
BIOE3040 Physiology for Bioengineering	3	* Prerequisite: BIOL 2051 and 2061 with labs
BIOE3050 & 3051 Cell & Molecular Bioengineering with lab	4	* Prerequisite: BIOL 2051 & 2061 w/labs; CHEM 2031 & 2061 w/labs
BIOE3060 Biostatistics, Measurement, and Analysis	3	* Prerequisite: MATH 3195 and BIOE 2020
BIOE3070 Bioengineering Lab I	3	
BIOE3071 Bioengineering Lab II	3	
BIOE3090 Introduction to BioDesign	3	
BIOE4035 Undergraduate BioDesign II	3	*Prerequisite: BIOE 3090
BIOE4045 BioDesign III	3	*Prerequisite: BIOE 4035
<b>BIOE Technical Electives:</b> Choose four <b>approved</b> upper-division, bioengineering technical electives. Students can apply one approved non bioengineering course. A second non-bioengineering technical elective must be petitioned.		12
<b>Total Program Hours:</b>		<b>128</b>

**SAMPLE ACADEMIC PLAN OF STUDY**

The following academic plan is a *sample* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, and individual preferences related to course load, schedules, or add-on programs such as minors or double-majors. **Students deviating from this plan must fulfill course prerequisites and must meet with the faculty advisor in their department to confirm degree requirements.**

Year One	<b>Semester 1</b>		CRS
	ENGR 1200 Fundamentals of Engineering Design Innovation	3	
	MATH1401 <sup>PE</sup> - Calculus I	4	
	BIOL2051 & 2071 - General Biology I with lab	4	
	CHEM2031 & 2038 - General Chemistry I with lab	4	
	ENGL 1020	3	

Year Two	<b>Semester 3</b>		CRS
	BIOE2010 <sup>PE</sup> - Intro to Programming for Bioengineers	2	
	MATH2421 <sup>PE</sup> - Calculus III	4	
	CHEM3411 & 3418 <sup>PE</sup> - Organic Chemistry I with lab	5	
	PHYS2311 & 2321 - General Physics I with lab	5	

Year Three	<b>Semester 5</b>		CRS
	BIOE3010 - Bioinstrumentation	3	
	BIOE3020 <sup>PE</sup> - Introduction to Biomechanical Analysis	3	
	BIOE3030 <sup>PE</sup> - Introduction to Biomaterials	3	
	BIOE3040 <sup>PE</sup> - Physiology for Bioengineering	3	
	BIOE3070 - Bioengineering Lab I	3	

Year Four	<b>Semester 7</b>		CRS
	BIOE4035 <sup>PE</sup> - Undergraduate BioDesign II	3	
	BIOE Technical Elective	3	
	BIOE Technical Elective	3	
	CU Denver Core	3	
	CU Denver Core	3	

<b>Semester 2</b>		CRS
BIOE1020 <sup>PE</sup> - Bioengineering Design and Prototyping II	3	
MATH2411 <sup>PE</sup> - Calculus II	4	
BIOL2061 & 2081 <sup>PE</sup> - General Biology II with lab	4	
CHEM2061 & 2068 <sup>PE</sup> - General Chemistry I with lab	5	

<b>Semester 4</b>		CRS
BIOE2020 <sup>PE</sup> - Intro to Comp Methods for Bioengineers	2	
MATH3195 <sup>PE</sup> - Linear Algebra and Differential Equations	4	
PHYS2331 & 2341 - General Physics II with lab	5	
ENGL2030	3	
CU Denver Core	3	

<b>Semester 6</b>		CRS
BIOE3050 <sup>PE</sup> - Cell & Molecular Bioengineering	3	
BIOE3051 <sup>PE</sup> - Cell & Molecular Bioengineering	1	
BIOE3060 <sup>PE</sup> - Biostatistics, Measurement, and Analysis	3	
BIOE3071 - Bioengineering Lab II	3	
BIOE3090 - Introduction to BioDesign	3	
CU Denver Core	3	

<b>Semester 8</b>		CRS
BIO4045 <sup>PE</sup> - BioDesign III	3	
BIOE Technical Elective	3	
BIOE or Upper-Division Technical Elective	3	
CU Denver Core	3	
CU Denver Core	3	

<sup>M</sup> Major Course Available    <sup>PE</sup> Prerequisite Enforced    <sup>PR</sup> Prerequisite Recommended