

# BIOENGINEERING

Fall Quarter	Units	Winter Quarter	Units	Spring Quarter	Units
<b>FIRST YEAR</b>					
BIEN 001 <i>Freshmen Seminar</i>	1	BIOL 005A & BIOL 05LA <i>Cell &amp; Molecular Biology &amp; Lab</i>	5	BIOL 005B <i>Organismal Biology</i>	4
CHEM 001A & CHEM 01LA <i>General Chemistry &amp; Lab</i>	5	CHEM 001B & CHEM 01LB <i>General Chemistry &amp; Lab</i>	5	CHEM 001C & CHEM 01LC <i>General Chemistry &amp; Lab</i>	5
ENGL 001A <i>Beginning Composition</i>	4	ENGL 001B <i>Intermediate Composition</i>	4	ENGL 001C or Alternate <i>Applied Intermediate Composition</i>	4
MATH 009A <i>First Year Calculus</i>	4	MATH 009B <i>First Year Calculus</i>	4	MATH 009C <i>First Year Calculus</i>	4
<b>SECOND YEAR</b>					
BIEN 010 (Offered Fall '23 & Winter '24) <i>Overview of Bioengineering</i>	4	CHEM 008/08LA <i>Organic Chemistry</i>	4	CHEM 008B/08LB <i>Organic Chemistry</i>	4
MATH 046 <i>Differential Equations</i>	4	CS 009A <i>Data-oriented Intro to Computing I</i>	4	MATH 010B <i>Multivariable Calculus</i>	4
PHYS 040A <i>Physics (Mechanics)</i>	5	MATH 010A <i>Multivariable Calculus</i>	4	PHYS 040C <i>Physics (Electricity/Magnetism)</i>	5
Breadth _____ <i>Humanities/Social Sciences</i>	4	PHYS 040B <i>Physics (Heat/Waves/Sound)</i>	5	Breadth _____ <i>Humanities/Social Sciences</i>	4
<b>THIRD YEAR</b>					
BIEN 101 <i>Quantitative Biochemistry</i>	4	BIEN 105 (Offered Winter '24 & Spring '24) <i>Circulation Physiology</i>	4	BIEN 115 <i>Quantitative Physiology</i>	4
BIEN 110 (Offered Fall '23 & Winter '24) <i>Biomechanics of the Human Body</i>	4	BIEN 125 <i>Biotechnology &amp; Molecular Engr.</i>	4	BIEN 120 <i>Biosystems &amp; Signals Analysis</i>	4
BIEN 111 <i>Stat. Methods &amp; Research Design</i>	4	BIEN/CEE 140A <i>Biomaterials</i>	4	BIEN 130 <i>Bioinstrumentation</i>	4
EE 005 <i>Circuits and Electronics</i>	4	Technical Elective* or Breadth _____	4	BIEN 130L <i>Bioinstrumentation Lab</i>	2
<b>FOURTH YEAR</b>					
BIEN 175A <i>Senior Design</i>	2	BIEN 175B <i>Senior Design</i>	4	BIEN 175C <i>Senior Design</i>	4
BIEN 135 <i>Biophysics &amp; Biothermodynamics</i>	4	Technical Elective* _____	4	Technical Elective* _____	4
BIEN 155 <i>Biotechnology Lab</i>	2	Breadth _____ <i>Humanities/Social Sciences</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4
Technical Elective* _____	4	Breadth _____ <i>Humanities/Social Sciences</i>	4	Breadth _____ <i>Humanities/Social Sciences</i>	4

To earn a B.S., you must complete all College and University requirements. For a full list of requirements, go to [catalog.ucr.edu](http://catalog.ucr.edu).

### ENGLISH COMPOSITION

A C or better is required in all English Composition courses to satisfy the graduation requirement. Please consult with your Academic Advisor for ENGL 1C alternatives.

### BREADTH REQUIREMENTS

For an approved list of Breadth courses, go to <http://student.engr.ucr.edu/>

### Humanities: (3 courses)

- A. World History: \_\_\_\_\_
- B. Fine Arts, Lit., Phil. or Rlst: \_\_\_\_\_
- C. Human Persp. on Science: \_\_\_\_\_

### Social Sciences: (3 courses)

- A. Econ. or Posc.: \_\_\_\_\_
- B. Anth., Psyc, or Soc.: \_\_\_\_\_
- C. General Social Science: \_\_\_\_\_

### Ethnicity: (1 course)

- 1. \_\_\_\_\_

### Upper Division: (2 courses)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_

### \* TECHNICAL ELECTIVES

Technical Electives may be offered throughout the Academic Year. Consult with your Faculty Advisor about potential offerings. See approved technical electives on back.

With the exceptions of BIEN 010, 110, and 105 in the 2023/2024 Academic Year, BIEN courses are offered only in the quarter shown.

Prerequisites for each course are shown in the UCR Catalog. Students who have not satisfied a course's prerequisites will not be eligible to register for the course. See page 2 for additional course-specific guidance.

Total Units: 190  
Max Units: 228

Course Plan is subject to change.

## Bioengineering Technical Electives

You must complete 4 courses (at least 16 units) of Technical Elective coursework. Acceptable courses in the Department of Bioengineering are listed below.

<u>Course</u>	<u>Course Title (Units)</u>	<u>Course</u>	<u>Course Title (Units)</u>
BIEN/MSE 136	Tissue Engineering (4)	BIEN 165	Biomolecular Engineering (4)
BIEN 137	Advanced Biomechanics (4)	BIEN 166	Bioinspired Engineering for Sustainable Energy (4)
BIEN 138	Fundamental Principles of Wound Repair (4)	BIEN 167	Medical Diagnostics (4)
BIEN/CEE 140B	Biomaterials (4)	BIEN 168	Bioengineering Analysis and Modeling (4)
BIEN 142	Introductory Biomedical Optical Imaging (4)	BIEN 190 *	Human-Technology Interaction (4)
BIEN/CEE 159	Dynamics of Biological Systems (4)		
BIEN 160	Biomedical Imaging (4)		

*\* In Spring 2024 only, offered as a special section of BIEN 190; consult with Academic Advisor*

**Course Specific Guidance** This list provides some specific guidance for selected courses in the BIEN curriculum for the 2023/2024 Academic Year.

**BIEN 001:** is required for first-year students. Transfer students should consult with your Academic Advisor.

**BIEN 010:** is offered Fall 2023 and Winter 2024.

**CHEM 008A/08LA and 008B/08LB:** Only the first two quarters of organic chemistry are required for BIEN majors.\*

**CS 009A:** Depending on the course plan year in which you started at UCR, you may be eligible to take CS 010A instead of CS 009A.

However, we strongly advise all students who have not already completed CS 010A take CS 009A

**BIEN 101:** is offered only in Fall 2023. This course must be completed with at least a grade of D– before you can register for BIEN 125.\*

**BIEN 110:** is offered Fall 2023 and Winter 2024. Complete BIEN 110 as early as you are eligible;

must be completed with at least a grade of D– before you can register for BIEN 105 and BIEN 115.

**BIEN 111:** is offered only in Fall 2023. Depending on the course plan year in which you started at UCR, you may be eligible to take STAT 155 instead of BIEN 111. However, we strongly advise all students who have not already completed STAT 155 to take BIEN 111 instead.

**EE 005:** Complete EE005 as soon as you are eligible, ideally in Fall of your third year but no later than Winter of your third year,

EE 005 is a prerequisite for BIEN 130/130L which are only offered in Spring. If EE005 is full, join the waitlist and consult with your Academic Advisor.

If you haven't completed EE 005 before Spring of your third year, you will not be able to register for BIEN 130/130L and graduation will be delayed by a year

**BIEN 105:** is offered Winter 2024 and Spring 2024. Complete BIEN 105 as early as you are eligible. At least a grade of D– before you can register for BIEN 120.

**BIEN 125:** is only offered Winter 2024.

**BIEN 140A:** is only offered in Winter 2024. Students interested in taking the technical electives BIEN 136 or BIEN 140B should complete BIEN 140A first.

**BIEN 120:** is only offered in Spring 2024.

**BIEN 130 and 130L:** BIEN 130 and 130L are only offered in Spring 2024. You must be enrolled concurrently in both BIEN 130 and 130L, and you must have completed EE 005 with at least a grade of D–. BIEN 130L with at least a grade of C–, you will not be able to register for BIEN 175A (Senior Design sequence)

**BIEN 135:** is only offered in Fall 2023.

**BIEN 155:** is only offered in Fall 2023. You must be enrolled concurrently in both BIEN 155 and BIEN 175A (or already have a grade of at least C– in BIEN 175A).

**BIEN 175A, BIEN 175B, BIEN 175C:** These courses are only offered in Fall 2023 (175A), Winter 2024 (175B), and Spring 2024 (175C).

You must complete 175A before you can register for 175B, and complete 175B before you can register for 175C.

**BIEN 190:** can be used to obtain credit for undergraduate research (including Tech Elective credit if graded *Letter Grade*); register through your Academic Advisor.

**BIEN 197:** can be used to obtain credit for undergraduate research (but not for Tech Elective credit); register through your Academic Advisor.

\* Students considering graduate/professional programs in health professions (premeds) should also consult with the Health Professions Advising Center (HPAC) for their recommendations about taking additional courses (for example, CHEM 008C/08LC and BCH 100).