

# BIOENGINEERING

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

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

### # multiple offerings

BIEN 010: Fall and Winter

BIEN 105: Winter and Spring

Course Plan is subject to change.

† Technical Electives may be taken in the third year if prerequisites have been met.

## 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>                                   |
|---------------|---|
| BIEN 111*     | Advanced Statistical Methods and Research Design for BIEN (4) |
| BIEN/MSE 136  | Tissue Engineering (4)  |
| BIEN 137      | Advanced Biomechanics (4)                                     |
| BIEN 138      | Fundamental Principles of Wound Repair (4)                    |
| BIEN/CEE 140B | Biomaterials (4)  |
| BIEN 142      | Introductory Biomedical Optical Imaging (4)                   |
| BIEN/CEE 159  | Dynamics of Biological Systems (4)                            |
| BIEN 160      | Biomedical Imaging (4)  |
| BIEN 165      | Biomolecular Engineering (4)                                  |
| BIEN 166      | Bioinspired Engineering for Sustainable Energy (4)            |
| BIEN 167      | Medical Diagnostics (4)                                       |

\*\*Note that you may meet one of the four Technical Elective requirement courses with an Upper Division course from other departments in the College of Engineering, however for some of these courses you may need to obtain permission of the instructor for enrollment.

\* For 2021-2022 academic year only students can select STAT 155 or BIEN 111 to fulfill the statistics requirement ; if taking both then BIEN 111 will fulfill one of their four Technical Electives.