

# Biological Engineering: Biotechnology & Biomolecular

## Sample AB Major in Engineering Sciences

### Prerequisites

MATH 3, 8, 13; or MATH 11; PHYS 13, 14; CHEM 5;  
ENGS 20 or COSC 1 and 10

### Common Core (3 courses)

ENGS 21: Introduction to Engineering\*  
ENGS 22: Systems  
ENGS 23: Distributed Systems and Fields

### Distributive Core (2 courses)

ENGS 24: Science of Materials  
ENGS 25: Introduction to Thermodynamics

### Gateway (2 courses)

ENGS 34: Fluid Mechanics  
ENGS 35: Biotechnology and Biochemical Engineering

### Electives (2 courses; 1 may be math or natural science)

CHEM 6: General Chemistry  
ENGS 56: Introduction to Biomedical Engineering

**Culminating Experience:** *ENGS 86, 88, 89 or one advanced ENGS course that may also count as 1) one of the above electives and 2) toward the BE Math and Natural Science Requirement or the BE ENGS/ENGG requirement.*

**Total:** *Includes 9 or 10 courses through AB*

### LEGEND

Allowable or potentially allowable in the BE concentration  
Math or Natural Science course

Introductory course: Not allowable in the BE concentration

\* Significant design content

## Sample BE Program

### **Math and Natural Science Requirement**

*9 course credits (minimum) including any completed for AB major requirements.*

BIOL 12: Cell Structure and Function

### **Applied MATH/ENGS Requirement**

*One of ENGS 91, 92 and 93 must be completed for the BE and may be counted as either a MATH course or an ENGS course in fulfilling BE requirements.*

ENGS 93: Statistical Methods in Engineering

### **ENGS/ENGG Requirement**

– 13.5 courses minimum (15.5 is typical), including courses completed for the AB major, 6 total with significant design content\*. ENGS 20 (or CS 1 + 10) counts as 0.5 ENGS credit.

– 3-course concentration, 1 with significant design content\*

– ENGS 89 and 90

### **Engineering Electives: 3-course concentration**

ENGS 57: Intermediate Biomedical Engineering

ENGS 58: Protein Engineering

1 from: ENGS 161: Microbial Physiology and Metabolic Engineering, ENGS 162: Methods in Biotechnology, ENGS 163: Advanced Protein Engineering\*, ENGG 166: Quantitative Human Physiology

### **Electives (3 courses; 2 may be math or natural science)**

BIOL 46: Microbiology

CHEM 51 or 57: Organic Chemistry

ENGS 30/PHYS 30: Biological Physics

ENGS 36: Chemical Engineering\*

### **Capstone Design Experience**

ENGS 89: Engineering Design Methodology and Project Initiation\*

ENGS 90: Engineering Design Methodology and Project Completion\*