

## Biological Engineering Curriculum

Effective Fall 2009

### General Education Core:

English Composition (FW: ENG 100, 100A, 101/101L, or ELI 100)

Multicult. Persp. (FG: e.g. HIST 151 and 152)

Economics (ECON 120, 130, or 131)

Social Sciences (DS: 1 course)

Humanities, Art, & Literature (DH, DL, or DA: 2 courses from different categories)

### Math and Science Core

#### Math:

MATH 241-244 (Calculus I-IV) or;  
MATH 251A-253A (Accel. Calculus)

Engineering Math Elective (MATH 302, 307, 311, ME 360, or CEE 417)

#### Biology:

BIOL 171/171L (Intro. Biol.)

BIOL 172/172L (Intro. Biol. II)

Biology Elective (BIOL 275/275L, MICR 351/351L, or MICR 485/485L)

### Engineering Core

Programming (EE 160)

Circuit Analysis (EE 211)

Statics (CEE 270)

### Biological Engineering

#### BE Core Courses (required):

BE 260 (Mass and Energy Balances)

BE 350/350L (Dynamic Syst. Model.)

BE 373 (Transport Phenomena)

BE 481 (Senior Engineering Design I)

BE 482 (Senior Engineering Design II)

In addition, courses must be taken fulfilling the following focus designations:

Contemporary Ethical Issues (E: 1 course)

Hawaiian, Asian, or Pacific Issues (H: 1 course)

Oral Communication (O: 1 course)

Writing Intensive (W: 5 courses)

#### Chemistry:

CHEM 162/162L or 181/181L (General Chem.)

CHEM 272/272L (Organic Chem.)

#### Physics:

PHYS 170/170L (General Phys. I)

PHYS 272/272L (General Phys. II)

Statistics (NREM 310)

Dynamics (CEE 271)

Thermodynamics (ME 311)

Fluid Mechanics (ME 322 or CEE 320)

#### BE Electives (must take $\geq 15$ credits):

BE 405 (Engineering Economics)

BE 410 (Biomass Conversion for Biofuel and Bioenergy)

BE 411 (Food Engineering)

BE 420 (Sensors and Instrumentation for Biological Systems)

BE 421 (Bioprocess Control)

BE 431 (Environmental Biotechnology)

BE 437 (Biosystems Unit Operations)

BE 440 (Bioremediation: Principles and Practice)

BE 460 (Bioreactor Design and Analysis)

BE 470 (Bioproducts and Bioprocess Design)

CEE 355 (Geotechnical Engineering)

For More Information about the BE major at UH Manoa, please contact:  
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