

Bioengineering (BIO ENG)

BIO ENG 10 Introduction to Biomedicine for Engineers 4 Units

Department: Bioengineering

Course level: Undergraduate

Term course may be offered: Fall

Grading: Letter grade.

Hours and format: 3 hours of Lecture and 1 hour of Discussion per week for 15 weeks.

This course is intended for lower division students interested in acquiring a foundation in biomedicine with topics ranging from evolutionary biology to human physiology. The emphasis is on the integration of engineering applications to biology and health. The goal is for undergraduate engineering students to gain sufficient biology and human physiology fundamentals so that they are better prepared to study specialized topics, e.g., biomechanics, imaging, computational biology, tissue engineering, biomonitoring, drug development, robotics, and other topics covered by upper division and graduate courses in UC Berkeley departments of Molecular and Cell Biology, Integrative Biology, Bioengineering, Electrical Engineering and Computer Science, Mechanical Engineering, and courses in the UC San Francisco Division of Bioengineering. The specific lecture topics and exercises will include the key aspects of genomics and proteomics as well as topics on plant and animal evolution, stem cell biomedicine, and tissue regeneration and replacement. Medical physiology topics include relevant engineering aspects of human brain, heart, musculoskeletal, and other systems.

Instructors: Conboy, Kumar

BIO ENG 22 Biotechnology 3 Units

Department: Bioengineering

Course level: Undergraduate

Term course may be offered: Fall

Grading: Letter grade.

Hours and format: 3 hours of Lecture per week for 15 weeks.

Prerequisites: 22L (must be taken concurrently).

This course is intended to introduce students to a variety of fields that fall under the biotechnology umbrella. In general, these fields include medical, microbial, agricultural, animal, and forensic biotechnology. Students in this course will learn the types of biotechnology projects currently being worked on, as well as the techniques and assays used within these projects.

Instructors: L. Lee, Dueck

BIO ENG 22L Biotechnology Laboratory 2 Units

Department: Bioengineering

Course level: Undergraduate

Term course may be offered: Fall

Grading: Letter grade.

Hours and format: 6 hours of Laboratory per week for 15 weeks.

Prerequisites: 22 (must be taken concurrently).

This course is intended to introduce students to a variety of laboratory techniques that are used in current day biotechnology projects. During this course, students will get hands-on molecular and cellular biotechnology experience working with *E. coli*, Yeast, Human and Mouse Cell Lines, DNA, RNA, and proteins. This is a bioengineering course; the focus of these exercises will be on the critical understanding of biological, biochemical, or physical mechanisms, and theories of different experimental methods, techniques, and instrumentation used. Second, students leaving this class should understand how to address a critical biological question and design experiments in a quantitative manner.

Instructors: L. Lee, Dueck

BIO ENG 24 Aspects of Bioengineering 1 Unit