



COURSE DESCRIPTIONS FOR BIOENGINEERING EMPHASIS CURRICULUM

ENGR 220A. Molecular Bioengineering.

(4) STAFF, Offered in Fall quarters

Prerequisite: one or more undergraduate courses in biochemistry or cell biology similar to MCDB 108ABC or Chem 142ABC or MCDB 103 or consent of instructor

Introduces students to molecular components of biology with application of engineering principles for analysis. Topics include: molecular components of cells, DNA/RNA structure and function, protein structure/function/folding, gene and protein regulation, DNA replication, and experimental and computational research methods.

ENGR 220B. Cellular Bioengineering

(4) STAFF, Offered in Winter quarters

Prerequisite: ENGR 220A or consent of instructor

This course introduces students to structural components of cells with application of engineering principles for analysis. Topics include: biomembrane structure and function, membrane proteins, membrane transport, intracellular compartments, intracellular trafficking, chemotaxis, cell cycle, apoptosis, and stem cells.

ENGR 220C. Tissue & Systems Bioengineering

(4) STAFF, Offered in Spring quarters

Prerequisite: ENGR 220B or consent of instructor

This course introduces students to tissue and organism-level organization with application of engineering principles for analysis. Topics include: cardiovascular, respiratory, digestive, and central nervous systems, structural components of organisms (bones and muscles), immune system, and pharmacology.

ENGR 225. Current Topics in Bioengineering

(1) STAFF, Offered Fall, Winter, and Spring quarters

Prerequisite: none

Seminar series highlighting current topics and advances in bioengineering presented by UCSB faculty or visiting scientists providing context and motivation for bioengineering learning, introducing students to concepts outside of their primary research specialty, and promoting interdisciplinary thinking and research collaboration.

ENGR 230. Bioengineering Student Seminar

(1) STAFF, Offered Fall, Winter, and Spring quarters

Prerequisite: none

Seminar series where students present their original thesis research and also review journal articles that critically analyze contemporary bioengineering research. Three quarters of ENGR 230 are required for the optional BioE graduate emphasis. Presentations will be evaluated and feedback provided.