BIEN 310. INTRODUCTION TO BIOMOLECULAR ENGINEERING.

Credits: 3

Offered by: Bioengineering (Faculty of Engineering)

Terms offered: Fall 2025

View offerings for Fall 2025 in Visual Schedule Builder.

Description

Forward and reverse engineering of biomolecular systems. Principles of biomolecular thermodynamics and kinetics. Structure and function of the main classes of biomolecules including proteins, nucleic acids, and lipids. Biomolecular systems as mechanical, chemical, and electrical systems. Rational design and evolutionary methods for engineering functional proteins, nucleic acids, and gene circuits. Rational design topics include molecular modeling, positive and negative design paradigms, simulation and optimization of equilibrium and kinetic properties, design of catalysts, sensors, motors, and circuits. Evolutionary design topics include evolutionary mechanisms, fitness landscapes, directed evolution of proteins, metabolic pathways, and gene circuits. Systems biology and synthetic biology.

- Prerequisite(s): BIEN 200 or permission of instructor.
- (3-0-6)