



CHEM-T550 Introductory Biochemistry

Protein composition and structure, Enzyme kinetics, catalytic and regulatory strategies, Carbohydrates, Nucleic acids, Lipids and cell membranes, Transducing and storing energy -metabolic cycles, Responding to environmental changes.

Upon completion of this course, students will be able to:

- Describe biochemistry as an evolving science by discussing concepts in forums.
- Discuss the methods and advances in the prediction of three-dimensional structures of proteins.
- Outline the possible functional consequences of amino acid substitutions in hemoglobin.
- Describe enzymatic reactions, inhibition, regulation and catalysis.
- Describe various forms of carbohydrates, lipids, nucleic acids and their derivatives.
- Relate to how specific channels and pumps transport ions and molecules across membranes.
- List the components and explain the molecular mechanisms of various signal transduction cascades.
- Discuss the significance of major metabolic pathways - Glycolysis, Gluconeogenesis, Citric Acid Cycle, Oxidative Phosphorylation and Photosynthesis.
- Calculate energy changes in biological pathways and how energy is stored in biological systems.
- Relate to how humans respond to environmental changes via sensory systems and molecular motors.
- Outline how drug candidates could be discovered in the process of drug development.

Course content:

Introduction to Biochemistry; Protein Structure; The Central Dogma Evolution & Bioinformatics; Hemoglobin; Review of Organic Chemistry; Metabolism Enzymes and Enzyme Kinetics Carbohydrates; Catalytic Strategies; Regulatory Mechanisms; Membranes; Membrane Channels & Pumps; Glycolysis and Gluconeogenesis; Citric Acid Cycle; Oxidative Phosphorylation; Nutrition; Sensory Systems, Molecular Motors, Drug Development

Learning materials:

Biochemistry (8th Edition) - Berg, Tymoczko, Gatto, Stryer. Publisher - Freeman Macmillan.

Assessment:

Quizzes: 25%

Exams: 20%

Forums: 25%

Literature Reading Assignments: 30%