Biochemistry

BIOCHEM 0305700

Credits: 3

**Course Learning Outcomes:**

Students will become familiar with a series of basic concepts in Biochemistry and life sciences, including but not limited to macromolecular structure, reversible ligand binding interactions, enzymes, enzyme kinetics, membrane structure and function, nucleic acid structure and function, modern methods in biotechnology, thermodynamics as applied to living systems, cellular metabolic processes and catabolism, and regulatory mechanisms.

**Required Textbook:** Course textbook is Lehninger Principles of Biochemistry, 7th Edition. Students must purchase the Sapling Plus online version of the textbook.

Amino acids and peptides: chemistry, stereochemistry, ionization, structure of the peptide bond, biological activities of peptides; chemical synthesis of peptides

Protein Methods: purification, composition, quantification

SDS gel electrophoresis animation

Protein structure; primary; amino acid sequence; sequence homology and its relevance to evolution

 Protein structure; secondary and tertiary

Protein Structure; tertiary and quaternary

Protein function: ligand binding; allostery; regulation

Enzymatic catalysis: principles that explain catalytic power and specificity; transition state complementarity

Enzymes: role of cofactors

Enzyme kinetics

1: an approach to understanding mechanism living graphs Enzyme kinetics

2: bisubstrate kinetics, inhibition, etc.

Enzyme mechanisms: principles

Chymotrypsin enzyme animation

Enzyme regulation: allosteric and covalent physical properties

Metabolism Overview & Practice Problems

Glycolysis and Gluconeogenesis

Glycolysis and Gluconeogenesis 2

inclusive See animated enzyme mechanisms

Glycogen Metabolism and Regulation

Citric Acid Cycle

Mitochondrial Electron Transfer

ATP Synthesis and Coupled Electron Transfer

FIRST EXAM 25%

SECOND EXAM 25%

FINAL EXAM 50%

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