Al-Al Bayt University
Faculty of Sciences
Biological Science

Course Title : Biochemistry
Course Number :404351
Credit Hours :3
Pre requisite :404252
Placement :
Instructor:
Course Description :
This course provides an overview of the main aspects of biochemistry by linking molecular interactions with their effects on the organism as a whole, especially with regard to human biology. The regulation of molecules is handled by discussing its hierarchical structure and studying its aggregation in complexes responsible for specific biological processes. Students will study the structure and functions of amino acids, proteins, enzymes, fats, carbohydrates and other biological structures. Topics addressing include enzyme kinetics, the characterization of major metabolic pathways, and their interconnection into tightly regulated networks.

General objectives :
The aims of the course are that the students acquire the bases in biochemistry to provide elementary knowledge/overview of structure and functions and metabolism of biomolecules, and can determine the biochemical composition of the body. The student uses the acquired knowledge in practical classes and training.

Course outline :

1. Introduction: Biochemistry and organization of cells:
- Basic concepts, Elements of biomolecules, Hydrocarbon molecules, The Functional groups, Isomers, Organic compounds: Polymers, The Diversity of Polymers, molecules, organisms, Biochemical energetic, Energy and Changes.

Water

- Properties, hydrogen bonds and its biological important, pH scale, buffers, acids and bases.

Amino acids and peptides:, and proteins

Structure, function and properties, some small peptides of physiological importance.,

Proteins
- Structural levels of proteins: primary, secondary, tertiary and quaternary, relation of protein structure and function, muscle contraction and hemoglobin

Enzymes

- Classification, structure and molecular mechanisms of enzymatic action.

Lipids and membranes

- Types of lipids and their chemical nature, biological membranes.

Nucleic acids and protein synthesis:
Level of structure, structure of nucleotides, structure of DNA, main types of RNA and their structures, transcription, post-transcriptional modification, translation, genetic code, ribozymes.

Carbohydrates

- Structures and the stereochemistry of monosaccharides, How do monosaccharides react? (The formation of glycosides), some important oligosaccharides, the structures and functions of polysaccharides, glycoproteins

Metabolism

- Energy changes and electron transfer, thermodynamics, standard free energy changes, nature of metabolism and nature of oxidation-reduction, coupling of energy production

Metabolism of carbohydrates

? Carbohydrates metabolism: Glycolysis, The fate of pyruvate and reactions of citric acid cycle (Krebs cycle), Control and regulation of glycolysis and citric acid cycle, Effect of hormones on glycolysis, Gluconeogenesis, Glycogen metabolism, The pentose phosphate pathway, Electron transport and oxidative phosphorylation.

* Lipid Metabolism: Lipid digestion, Lipoprotein metabolism, Oxidations of fatty acids (Beta-oxidation), Lipogenesis, Synthesis of phodspholipids, Metabolism of cholesterol, Regulation of lipid metabolism.

* . Protein metabolisms: Amino acid synthesis, Digestion of proteins, Amino acid catabolism, Mechanisms of regulation of protein synthesis

? Biochemical Connections: Diabetes.

Evaluation methodology :

References :

*Biochemistry 7th edition, Thompson,Campbell M. and Ferrell S.

Course Schedule :

Topic_____Hours

No Information Available...