



Biochemistry
BBT3009

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Course Objective:

1. The basic concept of pH and buffers
2. The structure and properties of carbohydrates.
3. The structure, properties and reactions of proteins and amino acids
4. The structure, properties of fats and lipids
5. The chemistry of nucleic acids

Learning Outcome: Upon successful completion of this course, students should be able to:

1. Understand the concept of pH and biological buffer system
2. Explain structure and function of biopolymers

UNIT I:pH, buffer system and Vitamins

Properties of Water, pH, pka, ionization of weak acids and bases; Henderson-Hasselbalch equation, concept of buffer, basic knowledge of covalent and Non-covalent Interactions in biological systems, Vitamins

UNIT II:Structure and Function of Carbohydrates

Definition and classification of carbohydrates; monosaccharides, oligosaccharides and polysaccharides, Storage and structural polysaccharides

UNIT III:Structure and Function of Lipids

Classification and nomenclature of fatty acids, glycerol, Storage and structural lipid; triacylglycerols, sphingolipids and phospholipids, sterols and steroid nucleus, glycolipids

UNIT IV:Structure and Function of Proteins

Amino Acids: Classification, properties, essential and non essential amino acids, peptides bonds, primary, secondary, tertiary and quaternary structure of proteins

UNIT V:Structure and Function of Nucleic acids

Nucleic acids: General structure and properties of purines, pyrimidines, nucleosides and nucleotides; double helical structure of DNA, Chargaff's rule, A, B, and Z form of DNA, hydrolysis of nucleic acids

Textbooks:

1. Lehninger, David. L. Nelson and Michael. M. Cox, 2004, Principles of Biochemistry, 4th ed., Worth Publishers
2. Eric Conn, Paul Stumpf, 2009, Outlines of Biochemistry, 4th ed., John Wiley & Sons
3. Jeremy M. Berg, John L. Tymoczko and Lubert Stryer, 2004, Biochemistry, 5th ed., Freeman Int. Edition

Reference books:

1. Donald Voet, Judith G. Voet, 2011 Biochemistry, 4th edition, Wiley Zubay G, 1993, Principles of Biochemistry, Brown (William C.) Co, U.S.