

MCYF205 Chemical Biology (3-0-0)

(3 credits)

Module -1

(20 hrs)

Introduction to Biomolecules:

Structure and Function of Carbohydrates: Monosaccharide, oligosaccharides, polysaccharides (starch, Glycogen, Cellulose), Optical Isomerism;

Structure and Function of Lipids: Saturated and unsaturated fatty acids, triacylglycerols, Phosphoglycerides, Sphingolipids, Waxes and Sterol;

Structure and Function of Proteins: 20 Amino acids, Peptide bond, Hierarchy of protein architecture, Ramachandran plot, 3-D structure;

Structure and Function of Nucleic Acids: DNA, RNA, Double Helix Model of DNA, Denaturation and Renaturation DNA; replication, transcription and translation.

Structure and function of Hormones, Minerals and Vitamins; Bio-complexes: Nucleoproteins, Glyco-proteins, Lipoproteins and Vitamin complexes.

Module-II (8Hr.)

Principle of Bioenergetics: Bioenergetics and Thermodynamics; Phosphoryl group transfer and energy currency-ATP; Biological Oxidation and reduction reactions

Metabolic processes: Introduction to metabolism of carbohydrates: Glycolysis, TCA Cycle, Gluconeogenesis.

Module-III

(10 hrs)

Transport Mechanism

Na⁺/K⁺ transport (Ion pump); O₂ transport by hemoglobin, CO₂ transport by carbonic anhydrase.

Enzymes: Properties of enzyme, classification of enzymes, mechanism of enzyme action, kinetics of enzyme action, activation energy, enzyme inhibition, coenzyme, apozyme and holozyme

Text Book

1. Principle of Bio-Chemistry – Lehinger, Nelson and Cox
2. Biochemistry of Biochemistry by L. Stryer
3. Fundamentals of Biochemistry – Voet & Voet
4. Biochemistry, C.B.Powar & G.R.Chatwal, Himalaya Publishing House.
5. Biochemistry, Rastogi, Tata McGraw Hill.