

**B.Tech. Biotechnology: Semester-III**  
**BBT 304: BIOCHEMISTRY**

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

**Course Objective**

The Students will know how the collection of thousands inanimate molecules that constitute living organisms interact to maintain and perpetuate life governed solely by the physical and chemical laws as applicable to the nonliving thing.

**Course Learning Outcomes**

After completing the course, the student shall be able to:

- CO1: Understand the chemistry of chemical bonding, atomic structure and molecular interactions
- CO2: Principles of biophysical chemistry
- CO3: Describe the chemistry of carbohydrates, lipids, proteins and nucleic acids
- CO4: Describe the chemistry of enzymes
- CO5: Identify the metabolic pathway of macro molecules

**Unit 1: Basics of Biochemistry**

Structure of atoms, molecules and chemical bonds. Stabilizing interactions (Van der Waals, electrostatic, hydrogen bonding, hydrophobic interaction, etc.). Principles of biophysical chemistry (pH, buffer, reaction kinetics, thermodynamics, colligative properties)

**Unit 2: Composition, structure and function of biomolecules: Carbohydrates and Lipids**

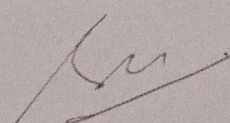
Monosaccharides, Disaccharides, Polysaccharides, Glycoconjugates: Proteoglycans, Glycoproteins, and Glycolipids, Carbohydrates as Informational Molecules, Metabolism of carbohydrates, LIPIDS: Storage Lipids, Structural Lipids in Membranes, Lipids as Signals, Cofactors, Pigments, Working with Lipids. Metabolism of lipid.

**Unit 3: Proteins**

Amino Acids, Peptides and Proteins, Covalent Structure of Proteins, Protein Structure; Secondary, Tertiary and Quaternary; Protein Denaturation and Folding. Conformation of proteins (Ramachandran plot, secondary structure, domains, motif and folds). Metabolism of protein.

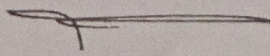
**Unit 4: Nucleic acids**

Nucleic Acid Structure, Nucleic Acid Chemistry, Other Functions of Nucleotides And vitamins. Conformation of nucleic acids (helix (A, B, Z), t-RNA, micro-RNA). Stability of nucleic acids.



Head

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