

B.Sc. Biotechnology; Semester-II
BST 201 Biochemistry

Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Examination Scheme Class Test -12Marks Teachers Assessment - 6Marks Attendance - 12 Marks End Semester Exam - 70 marks
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Prerequisite: - General knowledge of BST102 Cell Biology

Course Objectives:

1. To give an overview of biomolecules and their significance
2. To give basic knowledge of : properties of water, weak interaction in aqueous systems, Ionization of water
3. To have an overview of Proteins: Amino acids, peptides and polypeptides
4. To explain about the different biosynthetic pathways.
5. To explain the translation and post translational modification of proteins
6. To explain about the different types of lipids

Course Outcomes:

After completing the course, students will be able to:

- CO1: Understand various applications of Biomolecules, their structure and function
- CO2: Analyze the Gibbs free energy and enthalpy
- CO3: Identify different types of biosynthetic pathways of different biomolecules
- CO4: Understand the concept of lipids and their significance
- CO5: Knowledge of Electron-Transfer Reactions in Mitochondria, ATP Synthesis, Regulation of Oxidative Phosphorylation.

CO6: Understand various aspects of metabolism of biomolecules

Detailed Syllabus:

<p>UNIT-1 Water</p> <p>Water: properties of water, weak interaction in aqueous systems, Ionization of water, weak acids & weak base, Concept and calculation: pH, pKa, Gibbs free energy and enthalpy.</p> <p>Protein: Amino acids, peptides and polypeptides, Primary, secondary and tertiary structure, Ramchandran plot, translation and post translational modification. Metabolic Fates of Amino Groups, Nitrogen Excretion and the Urea Cycle, Pathways of Amino Acid Degradation</p>
<p>UNIT-2 Carbohydrates</p>

Head

Department of Biotechnology
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Dean

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Carbohydrates: Monosaccharide's and Disaccharides, Polysaccharides, Glyco-conjugates: Proteoglycans, Glycoproteins and Glycolipids, Glycolysis, Feeder Pathways for Glycolysis, Fates of Pyruvate under Anaerobic Conditions: Fermentation, Gluconeogenesis, Pentose Phosphate Pathway of Glucose Oxidation, citric acid cycle: Production of Acetyl-CoA, Reactions of the Citric Acid Cycle, Regulation of the Citric Acid Cycle, The Glyoxylate

UNIT-3 Lipid

Lipid: Storage Lipids, Structural Lipids in Membranes, Lipids as Signals, Cofactors, and Pigments, Digestion, Mobilization, and Transport of Fats, Oxidation of Fatty Acids, Ketone Bodies, Triacylglycerides, Phospholipids, polar and non polar lipids. Cholesterol, Sphingolipids, cerebrolipids

Text and Reference Books


1. Analytical Biochemistry 3rd Ed. by Holme, D. J. & Peck, H.
2. Basic Concepts in Biochemistry A Student's Survival Guide by Gilbert, H. F.
3. Biochemistry (3rd ed. 1994) by Rawn J. D.
4. Biochemistry by Todd, W. B., Mason, M., Bruggen, R. V. & Macmillan.
5. Biochemistry by Voet&Voet


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