FACULTY OF SCIENCE AND HUMANITIES

B.Sc. (Biotechnology) Semester-2

In Effect from Academic Year 2021-22

Subject Code: 2SC1010201	**Subject Title: BIOTECHNOLOGY**
Course Type: Core Course	

Course Objective:

Living systems are based on the functions of various biochemical reactions that are basically based on biomolecules like, carbohydrates, lipids, proteins and nucleic acids. The students will learn the fundamental aspects of such biomolecules by opting for such course.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
4	4	4	2	70	30	30	20	150

A. Biotechnology Theory:

Unit	Content	Lectures	Weight (%)
1	**Introduction to Biochemistry:** A historic prospective, ancient & modern biochemistry **Types of Bonds:** Covalent, Ionic, Hydrogen, Van der wall, Hydrophobic interactions **Water:** water as solvent, properties of water, ionization of water, pka values and their importance, pH and pH scale, acid dissociation constant pka and titration curve, Henderson-Hasselbalch equation **Buffers:** Buffer systems and buffer system of blood, weak acid and weak base, dissociation constant of weak acid and base	11	18
2	**Amino acids & Proteins:** Structure & Function: Properties of Amino acids and their classification, Forces stabilizing protein structure and shape. Different Level of structural organization of proteins, Protein Purification. Denaturation and renaturation of proteins. **Lipids:** Functions and Classification of Lipids, fatty acids, Cholesterol and Triglyceride.	19	32
3	**Carbohydrates:** Structure, Classification , Function and reactions of Monosaccharides, Disaccharides and Polysaccharides. Mucopolysaccharides, Glycoprotein. **Vitamins:** Classification, Biological Significance	18	30
4	**Nucleic acids:** History, Nucleosides & Nucleotides. Nucleic acid (DNA & RNA). Chargaff's rules, Double helical model of DNA and Different form of DNA (A, B, Z form of DNA), denaturation and renaturation of DNA.	12	20

Learning Outcome:

By offering this course student will learn basic structure of biomolecules and their variations and their functions. This course basically deals with basics of biochemistry.

Reference book:

1. Biochemistry-LUbretStryer Freeman International Edition.
2. Biochemistry-KeshavTrehan Wiley Eastern Publications
3. Fundamentals of Biochemistry J.L. Jain S.Chand and company
4. Biochemistry, Prasaranga, Bangalore University
5. Fundamental of Biochemistry-Dr. A.C. Deb
6. Textbook of Organic Chemistry (A Modern approach) P.L. Soni, Sultan Chand and Sons, Publishers.
7. The Biochemistry of Nucleic acid-tenth Edition-Roger L.P. Adams, John T. Knower and David P. Leader, Chapman and Hall Publications.
8. Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Biochemistry. VI Edition. W.H Freeman and Co.Nelson, D.L., Cox, M.M. (2004)
9. Lehninger Principles of Biochemistry, 4th Edition, WHFreeman and Company, New York, USA.
10. Biochemistry, Dr. U. Satyanarayana, Arunabha Sen, BOOKS AND ALLIED (P) LTD.8/1 Chintamoni Das Lane, Kolkata 700009

B. Biotechnology Practical-1SC1010201: BIOCHEMISTRY:

1. Qualitative tests for Carbohydrates, lipids and proteins
2. Preparation of standard solutions and buffer solutions
3. Operation of pH meter and measurement of pH
4. Estimation of reducing sugar.
5. Estimation of non reducing sugar.