CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

Offered By Department Of BIO-TECHNOLOGY

Semester 1st (Major Course)

Course Title: Biomolecules-Structure and Function

Course Code: UGBTC25J101 **Max. Marks 100**
Credits: 4 (Theory: 3, Practical: 1) **Theory External: 60; Min Marks: 24**
Contact hours: 75 (Theory 45, Practical 30) **Theory Internal (Continuous Assessment): 15 Marks, Min Marks: 06**
Practical Experimental Basis= 15, Min. Marks: 06
Practical Experimental (Continuous assessment) = 10, Min. Marks: 04

Objective:
Introduce students to basic concepts of biomolecules and their function.

Course Outcome:
On completion of the course the students would be able to:
1. Distinguish different biomolecules based on structure and function
2. Get an insight about basic metabolic pathways
3. Estimate biomolecules by different qualitative methods
4. Handle different laboratory instruments

Unit-I: **15h**

Carbohydrates

Introduction and Classification of Carbohydrates, Structure and Function of Mono (Glucose, Mannose, Fructose, Galactose), Di (Maltose, Lactose, Sucrose) and Polysaccharides (Glycogen, Starch, Cellulose, Heparin and Hyaluronic Acid), Isomerism in Carbohydrates, Mutarotation, Glycolysis, TCA Cycle, Electron Transport Chain.

Unit-II: **15h**

Amino Acids and Proteins

Amino acids: Structure and classification, Levels of protein structure (Primary, Secondary, Tertiary and Quaternary structure of Proteins), Forces stabilizing Protein Structure, Ramachandran Plot, Overview of non-protein amino acids, Transamination, Deamination, Urea Cycle.

Unit-III: **15h**

Lipids and Nucleic Acids

Introduction and Classification of Lipids, Fatty acids: structure, function and classification, General structure and functions of Triglycerides, Phospholipids and Cholesterol, Transport of fatty acids, β-oxidation of fatty acids, Introduction to nucleosides and nucleotides.

Unit IV: PRACTICALS **30h**

1. Good Lab Practices.
2. Introduction to various Equipment used in Biotechnology Laboratory
3. Preparation of solutions based on Molarity, Molality, Normality and Percentage.
4. Standardization of solutions.
5. Preparation of buffers.
6. Qualitative tests for Carbohydrates, Lipids and Proteins.

Books Recommended:

1. Principles of Biochemistry by David L. Nelson, Michael M. Cox.
2. Biochemistry by Jeremy M. Berg, John L. Tymoczko and Lubert Stryer .
3. Biochemistry by U. Satyanarayan.
4. Introduction to practical Biochemistry, Sawhney and Sinha
5. Principles of Biochemistry, J.L Jain