FACULTY OF SCIENCE
B.Sc. (Biotechnology) Semester-3
In Effect from Academic Year 2022-23

Subject Code: 2SC1010301	Subject Title: Cellular Metabolism
Course Type: Core Course	

Course Objective: This course is designed to make the students competent for the comprehensive action and performance of the enzyme and cell constituents of prokaryotes and eukaryotes. It will provide the complete knowledge on types, function and control of enzymes.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
3	-	3	-	3	70	30	-	-	100

Biotechnology Theory:

Unit	Content	Lectures	Weight (%)
1	**Basics of Enzyme**: Enzyme as a biocatalyst, coenzyme, cofactor, Nomenclature and Classification of enzyme, Basic concept of enzyme substrate reaction. Factor affecting on enzyme catalyze reaction Overview of catalytic mechanisms of enzyme Enzyme kinetics: M-M equation , Double reciprocal plot Inhibition of enzyme Regulations of enzymes-allosteric and Covalent regulation	15	33%
2	**Glucose Metabolism:** Glycolysis and fate of pyruvate (Alcohol and lactic acid fermentation), TCA cycle, Pentose phosphate pathway, Gluconeogenesis. **ETC & Oxidative phosphorylation**: ETC of mitochondria, electron carriers,complexes of ETC,ATP generation coupled to electron transport	15	33%
3	**Lipid metabolism:** Lipid oxidation (Beta Oxidation),Fatty acid biosynthesis **Amino acid metabolism**: transamination, Deamination, Urea cycle **Photosynthesis:** Photophosphorylation in plant (Light reaction), Carbohydrate synthesis coupled to photophosphorilation (Dark reaction or C3 cycle or calvin cycle),C4 cycle	15	34%

Learning Outcome: Gain the knowledge regarding the biosynthesis and degradation of Biomolecules in different organisms. Understanding of structure, function, regulation, kinetics and inhibitors of various enzymes.

Reference book:

Biochemistry, Lubert Stryer, 6th Edition, WH Freeman, 2006.
Harper's illustrated Biochemistry by Robert K. Murray, David A Bender, Kathleen
Nelson, D.L., Cox, M.M. (2004) Lehninger Principles of Biochemistry, 4th Edition,
Biochemistry, U Satyanarayan
Biochemistry, D.Voet and J.G.Voet.
Biochemistry: Chemical Reactions of the Living Cells (Vol.I & II), D.Metzerler
Fundamentals of Enzymology, N.C. Price and L.Stevens
Understanding Enzymes:, Trevor Palmer
Biochemistry, Jain & Jain
Enzymology, T. Devse