

<b>15BT103</b>	<b>BIOCHEMISTRY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>Total No. of Contact Hours – 45</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
	<b>Prerequisite</b>				
	<b>Nil</b>				
<b>PURPOSE</b>					
To provide an understanding of the functions of various biomolecules and their metabolism.					
<b>INSTRUCTIONAL OBJECTIVES</b>					
1.	To study structural and functional properties of carbohydrates, proteins, lipids and nucleic acids				
2.	To emphasize the role of biomolecules by providing basic information on specific metabolic diseases and disorders				

#### **UNIT 1 INTRODUCTION TO BIOCHEMISTRY (12 Hours)**

Introduction-Chemical bonds-pH-Buffers-Carbohydrates-Lipids-Proteins

#### **UNIT 2 METABOLISM OF CARBOHYDRATES (8 Hours)**

Introduction to Metabolism-Glycolysis-Citric acid cycle-Gluconeogenesis-Glycogen metabolism-Glycogenesis-Glycogenolysis-Biochemical aspects of Diabetes Mellitus

#### **UNIT 3 PROTEIN METABOLISM (9 Hours)**

Introduction-Metabolism of amino acids-Transamination-Deamination-Metabolism of ammonia-Urea cycle-Biosynthesis of amino acids-Disorders of tyrosine (phenylalanine) metabolism

#### **UNIT 4 FATTY ACID METABOLISM AND NUCLEIC ACID METABOLISM (8 Hours)**

Introduction-Fatty acid oxidation-Ketone bodies & Ketogenesis-Biosynthesis of Fatty acids-Eicosanoids-Cholesterol Biosynthesis-Lipoproteins-Disorders of Lipid metabolism-Nucleic acids: Biosynthesis of Purine and Pyrimidines-Degradation of purine nucleotides and pyrimidine nucleotides-Disorders of Purine and pyrimidine metabolism

#### **UNIT 5 OXIDATIVE PHOSPHORYLATION (8 Hours)**

Introduction-Bioenergetics, High energy compounds, Biological oxidation-Electron transport chain, Oxidative phosphorylation, Chemiosmotic theory-Shuttle pathway – Glycerol phosphate Shuttle, Malate aspartate Shuttle –Shunt pathways

#### **REFERENCES**

1. Jain, J L, Jain, Nitin, Sunjay Jain, “*Fundamentals of Biochemistry*,” S. Chand Group, ISBN: 8121924537
2. U.Satyanarayana & U. Chakrapani, “*Biochemistry*,” Books And Allied (p) Ltd., ISBN: 8187134801
3. David L. Nelson, Albert Lester Lehninger, Michael M. Cox, “*Lehninger Principles of Biochemistry*,” Edition 5, illustrated, W. H. Freeman, 2008
4. Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, “*Biochemistry*,” Ed. 7, W. H. Freeman, 2012

<b>15BT103 BIOCHEMISTRY</b>												
<b>Course designed by</b>		<b>Department of Biotechnology</b>										
1	<b>Student Outcomes</b>	a	b	c	d	e	f	G	h	i	j	k
		X			X							
2	Mapping of instructional objectives with student outcomes	1			2							
3	Category	General (G)		Basic Sciences (B)			Engg. Sci. & Tech. Arts (E)			Professional Subjects (P)		
										X		
4	Broad Area ( for courses under ‘P’ only)	Biotechnology		Bioprocess Engineering			Chemical Engineering					
		X		--			--			--		
5	Approval	23 <sup>rd</sup> meeting of Academic Council, May 2013										