

Course Code	Course Title	L	T	P	C
BABIT101	Biochemistry	3	0	2	4
Pre-requisite	NIL	Syllabus Version			
		1.0			
Course Objectives					
1. Classification of Biomolecules based on structure 2. Relate structure and function of macromolecules 3. Understand the biochemical pathways					
Course Outcomes					
1. Understand the foundations of biochemistry and the importance of solvents 2. Classify biomolecules based on their structure and properties 3. Describe the biochemical pathways 4. Infer the structure-function relation of biomolecules 5. Demonstrate the biochemical behavior of biomolecules					
Module:1	Foundations of Biochemistry	6 hours			
Properties of living system: Review on cellular, chemical, physical, genetic and evolutionary backgrounds to biochemistry; Structure of water; Solvent and ionization property of water and water as a reactant; pH and buffers and their importance.					
Module:2	Carbohydrates	9 hours			
Classification; Structure and function; Glycoconjugates: Proteoglycans, Glycoproteins and glycolipids; Glycolysis; TCA cycle; Oxidative phosphorylation; Gluconeogenesis and pentose phosphate pathway and their regulation.					
Module:3	Proteins	10 hours			
Classification and function of proteins; Structural organisation of proteins: primary, secondary, tertiary and quaternary (Silk fibroin, Collagen, Myoglobin and Hemoglobin); Classification; Structure and biological importance of amino acids; Acid base properties and stereochemistry of amino acids; Amino acid synthesis precursors and routes of nonessential amino acids.					
Module:4	Lipids	9 hours			
Fatty acids: Classification, structure, properties, function and metabolism; Simple lipids triacylglycerol and waxes: Classification, structure, properties and biological function; Compound lipids: Phospholipids and glycolipids; Cholesterol: Structure, properties and importance.					
Module:5	Nucleic acids	9 hours			
Composition; Properties and function of nucleic acids; Structure of DNA; Metabolism: Synthesis of purines and pyrimidines.					
Module:6	Contemporary Issues	2 hours			

Contemporary Topics	
Total Lecture Hours:	45 hours
Text Book(s)	
1. David L. Nelson and Michael M. Cox., W.H, " Lehninger Principles of Biochemistry: International Edition ", Freeman and Co Ltd USA, 8 th Edition, 2019 2. Donald Voet, Judith G. Voet, " Voet's Biochemistry, 4th Edition ", Wiley India, 4 th Edition, 2021	
Reference Books	
1. Thomas M. Devlin, " Textbook of Biochemistry with Clinical Correlations ", Wiley, 7 th Edition, 2015 2. Jeremy M. Berg, Lubert Stryer, John Tymoczko and Gregory Gatto, , " Biochemistry ", Macmillan International Higher Education New York USA, 9 th Edition, 2019	
Indicative Experiments	
1. Laboratory practices in biochemistry and reagent preparation (calculations)	3 hours
2. Preparation of buffers	3 hours
3. pKa estimation	3 hours
4. Acid-base titration of amino acids	3 hours
5. Qualitative analysis of carbohydrates	3 hours
6. Qualitative analysis of amino acids	3 hours
7. Protein estimation by Lowry's method	3 hours
8. Estimation of reducing sugar by DNS method	3 hours
9. Quantification of amino acids by Ninhydrin method	3 hours
10. Estimation of total sugars by Anthrone method	3 hours
Total Laboratory Hours:	30 hours
Mode of Evaluation :Continuous Assessment Test, Digital Assignment, Quiz, Final Assessment Test, Lab Continuous Assessment, Lab Final Assessment, Oral Examination, Seminar, Group Discussion, Presentation	
Recommended by Board of Studies :	26-02-2025
Approved by Academic Council : No. 77	13-03-2025