Course Contents

Biochemistry-I (LS 401)

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Sl. No.	Topic	Faculty	No. of lectures
1.	History of Biochemistry. Evolution of the concept of the applicability of basic laws of chemistry and thermodynamics in cell function. Concept of molecular interactions and its importance in understanding cellular processes.	SKG	
2.	Diversities of biomolecules: carbohydrates, polysaccharides, proteins, nucleic acids, lipids, glycoproteins, nucleoproteins, glycolipids, lipoproteins etc. Role of small molecules and trace elements in biology.	SKG	
3.	Structure of amino acids, peptide bonds, Ramachandran Plot, alpha helical and beta pleated structures-I	SKG	
4.	Structure of amino acids, peptide bonds, Ramachandran Plot, alpha helical and beta pleated structures-II	SKG	
5.	Motifs, domains, super secondary structures of proteins. Classification of proteins based on the structures like Zn finger, lucine zipper proteins. Functional relationship between domains and function of proteins.	SKG	
6.	Structures of fibrous proteins like collagen, keratin, and elastin.	SKG	
7.	Protein structure and function: enzyme functions, specificity of enzymes. Induced fit model of enzyme function. Electronic and geometrical compatibility.	SKG	
8.	Structure of hemoglobulin, oxygen binding properties and its relation to its structure mechanisms of cooperability in oxygen binding.	SKG	
9.	Evolution of haemoglobin and myoglobin and their differences. Hemoglobin structure and its physiological functions as an oxygen transporter.	SKG	
10.	Isolation and purification of proteins by various conventional and advance methods.	SKG	
11.	Isolation and purification of proteins by various conventional and advance methods		
12.	Basic concepts of protein folding and stability, folding pathways, role of accessory proteins in protein folding.	SKG	
	Mid Semester examination		

13.	Monosaccharides and derivatives of sugars, polysaccharides, glycosaminoglycans, proteoglycans, protein glycosylations and its significance	SLP	
14.	Fattyacids, triacylglycerols, glycerophospholipids, sphingolipids, cholesterol lipid bilayers	SLP	
15.	Biological membranes, integral membrane proteins, lipoproteins and trafficking through membrane	SLP	
16.	Enzyme catalysis, specificity of enzyme action, coenzymes and vitamins	SLP	
17.	Classification of enzymes, factors affecting enzymes activities, feedback and allosteric inhibition	SLP	
18.	Chemical kinetics and order of reactions, Michaelis and Menten equation, V max and Michaelis constant	SLP	
19.	Competitive and uncompetitive inhibition, bisubstrate reaction	SLP	
20.	Mechanisms of acid base, covalent, metal ion catalysis	SLP	
21.	Mechanisms of actions of seine proteases, glutathione reductases	SLP	
22.	Biochemical problems	SLP	