



DEPARTMENT OF PHARMACY

Course: Bachelor of Pharmacy

LESSON PLAN

Faculty Name: Palika Sehgal

Subject Name: Biochemistry and Clinical  
Pathology

Class: B. Pharmacy – 2<sup>nd</sup> Sem

Subject Code: BP203T

**Scope of the Subject:** Biochemistry deals with a complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand the metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on the genetic organization of the mammalian genome and hetero & auto-catalytic functions of DNA

**Course outcome:** Upon completion of this course the student should be able to:

- Understand the significance of Biochemistry.
- Describe the chemistry of carbohydrate, lipids, proteins and lipids.
- Understand the catalytic role of enzymes, the importance of enzyme inhibitors in the design of new drugs, therapeutic and diagnostic applications of enzymes
- Understand the metabolism of nutrient molecules in physiological and pathological conditions.
- Apply knowledge and skills associated with clinical pathology

Number of Lectures: 45

Each lecture: 01 hour

Lecture No.	Particular	Remark/Date
<b>Module 1: Biomolecules</b>		
1.	Introduction , classification , chemical nature and biological role of carbohydrate	
2.	Introduction , classification , chemical nature and biological role of Lipids	
3.	Introduction , classification , chemical nature and biological role of nucleic acids, amino acids	
4.	Introduction, classification, chemical nature and biological role of proteins.	
<b>Bioenergetics</b>		
5.	Concept of free energy, endergonic and exergonic reaction	
6.	Relationship between free energy, enthalpy and entropy	
7.	Redox potential	
8.	Energy rich compounds, classification , biological significances of ATP	
9.	Energy rich compounds, classification , biological significances	

	of cyclic AMP	
<b>Module 2: Carbohydrate metabolism</b>		
10.	Glycolysis- Pathway, energetic and significance	
11.	Citric acid cycle- Pathway, energetic and significance	
12.	HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency	
13.	Glycogen metabolism Pathways and glycogen storage disease (GSD)	
14.	Gluconeogenesis- Pathway and its significance	
15.	Hormonal regulation of blood glucose level and diabetes mellitus	
<b>Biological Oxidation</b>		
16.	Electron transport chain (ETC) and its mechanism	
17.	Oxidative phosphorylation & its mechanism and substrate level phosphorylation	
18.	Inhibitors ETC and Oxidative phosphorylation/uncouplers	
<b>Module 3: Lipid metabolism</b>		
19.	B-Oxidation of saturated fatty acid (Palmitic acid)	
20.	Formation and utilization of ketone bodies; ketoacidosis	
21.	De novo synthesis of fatty acids (Palmitic acid)	
22.	Biological significance of cholesterol and conversion of cholesterol into bile acids , steroids hormone and vitamin D	
23.	Disorders of lipid metabolism; Hypercholesterolemia, atherosclerosis, fatty liver and obesity	
<b>Amino acid metabolism</b>		
24.	General reactions of amino acid metabolism: Transamination, deamination & decarboxylation	
25.	Urea cycle and its disorders	
26.	Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenylketonuria, Albinism)	
27.	Catabolism of phenylalanine and tyrosine and their metabolic disorders ( Alkeptonuria, tyrosinemia)	
28.	Synthesis and significance of biological substances; 5-HT, melatonin, dopamine	
29.	Synthesis and significance of biological substances; 5-HT,noradrenaline, adrenaline	
30.	Catabolism of heme; hyperbilirubinemia and jaundice	
<b>Module 4: Nucleic acid metabolism and genetic information transfer</b>		
31.	Biosynthesis of purine and pyrimidine nucleotides	
32.	Catabolism of purine nucleotides and hyperuricemia and Gout disease	
33.	Organization of mammalian genome	
34.	Structure of DNA and RNA and their functions	
35.	DNA replication (semi conservative model)	
36.	Transcription or RNA synthesis Genetic code	
37.	Translation or Protein synthesis and inhibitors	
<b>Module 5: Enzyme</b>		
38.	Introduction, properties, nomenclature and IUB classification of	

	enzymes	
39.	Enzyme kinetics (Michaelis plot, Line Weaver Burke plot)	
40.	Enzyme inhibitors with examples	
41.	Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation	
42.	Therapeutic and diagnostic applications of enzymes and iso-enzymes	
43.	Coenzymes –Structure and biochemical functions	
<b>Revision</b>		
44.	Revision of previous question papers	
45.	Revision of previous question papers	
46.	Revision of previous question papers	
47.	Revision of previous question papers	
48.	Revision of previous question papers	

**Teacher in-charge**

**HOD**

**Principal**