



Program	Bachelor of Pharmacy (BPharm)	Semester - 3
Type of Course	-	
Prerequisite		
Course Objective	-	
Effective From A.Y.	2023-24	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				External Marks (T)	Internal Marks (T)	External Marks (P)	Internal Marks (P)	
3	1	4	6	75	25	35	15	150

SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
1	UNIT 1 1. Biomolecules Introduction, classification, chemical nature and biological role of carbohydrate, lipids, nucleic acids, amino acids and proteins. 2. Bioenergetics Concept of free energy, endergonic and exergonic reaction, Relationship between free energy, enthalpy and entropy; Redox potential. Energy rich compounds; classification; biological significances of ATP and cyclic AMP	8	18
2	UNIT 2 3. Carbohydrate metabolism Glycolysis – Pathway, energetics and significance Citric acid cycle- Pathway, energetics and significance HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency Glycogen metabolism Pathways and glycogen storage diseases (GSD) Gluconeogenesis- Pathway and its significance Hormonal regulation of blood glucose level and Diabetes mellitus 4. Biological oxidation Electron transport chain (ETC) and its mechanism. Oxidative phosphorylation & its mechanism and substrate level phosphorylation Inhibitors ETC and oxidative phosphorylation/ uncouplers	10	23
3	UNIT 3 5. Lipid metabolism β-Oxidation of saturated fatty acid (Palmitic acid) Formation and utilization of ketone bodies; ketoacidosis De novo synthesis of fatty acids (Palmitic acid) Biological significance of cholesterol and conversion of cholesterol into bile acids, steroid hormone and vitamin D Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity. 6. Amino acid metabolism General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenylketonuria, Albinism, alkaptonuria, tyrosinemia) Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline Catabolism of heme; hyperbilirubinemia and jaundice	10	23
4	UNIT 4	10	23



Course Content		T - Teaching Hours W - Weightage	
Sr.	Topics	T	W
	7. Nucleic acid metabolism and genetic information transfer Biosynthesis of purine and pyrimidine nucleotides Catabolism of purine nucleotides and Hyperuricemia and Gout disease Organization of mammalian genome Structure of DNA and RNA and their functions DNA replication (semi conservative model) Transcription or RNA synthesis Genetic code, Translation or Protein synthesis and inhibitors		
5	UNIT 5 8. Enzymes Introduction, properties, nomenclature and IUB classification of enzymes Enzyme kinetics (Michaelis plot, Line Weaver Burke plot) Enzyme inhibitors with examples Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation Therapeutic and diagnostic applications of enzymes and isoenzymes Coenzymes –Structure and biochemical functions	7	13
Total		45	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	30	30	20	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
C01	Knowledge and understanding of the biomolecules and bioenergetics
C02	Knowledge and understanding of biochemical facts and metabolism of nutrient molecules in physiological and pathological conditions.
C03	Understanding the genetic organisation of mammalian genome and functions of DNA in the synthesis of RNAs and proteins
C04	Understanding the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
C05	Ability to perform quantitative and qualitative analysis of various nutrient and biochemical substances in biological fluids.

Reference Books	
1.	Biochemistry (TextBook) By Satyanarayana. U. & Chakrapani U. Elsevier India
2.	BIOCHEMISTRY (TextBook) By SURYAPRAKASH AND DR. SANDEEP K BANSAL NIRALI PUBLICATION 1ST, Pub. Year 2018
3.	PHARMACEUTICAL BIOCHEMISTRY-III (TextBook) By DR.SANJAY D.SAWANT,DR.GAURISHANKAR AND MRS.MINAL R.GUPTA TECH-MAX PUBLICATION 1ST, Pub. Year 2017
4.	BIOCHEMISTRY By DR.PANKAJA NAIK CAREER PUBLICATION 1ST, Pub. Year 2005
5.	FUNDAMENTAL OF BIOCHEMISTRY By DR.A.C.DEB NEW CENTRAL BOOK AGENCY 8TH, Pub. Year 2004
6.	TEXTBOOK OF BIOCHEMISTRY By DM VASUDEVAN SHREEKUMAR S JAYPEE BROTHER MEDICAL PUBLISHER 4TH, Pub. Year 2005



List of Practical

1.	Introduction to carbohydrates.
2.	To identify given unknown sample of Carbohydrates.
3.	To identify given unknown sample of Carbohydrates.
4.	To identify given unknown sample of Proteins.
5.	Detection and identification of given protein sample
6.	Detection and identification of given protein sample
7.	To analyse given urine sample for its abnormal constituents
8.	To estimate total protein in plasma by biuret method
9.	To estimate creatinine in blood
10.	To estimate glucose in blood by folin Wu method
11.	To estimate the total Cholesterol in plasma
12.	To determine the Achromic point and Chromic period of salivary amylase
13.	To prepare buffer solution and measure of pH
14.	To estimate given unknown sample solution
15.	Detection and identification of given protein sample

List of Tutorial

1.	REVISION-1
2.	REVISION-2
3.	REVISION-3
4.	REVISION-4
5.	REVISION-5
6.	REVISION-6
7.	REVISION-7
8.	REVISION-8
9.	REVISION-9
10.	REVISION-10
11.	REVISION-11
12.	REVISION-12
13.	REVISION-13
14.	REVISION-14
15.	REVISION-15