TEACHING PLAN: BIOCHEMISTRY & CLINICAL PATHOLOGY

SCHOOL: (SOP) SCHOOL OF PHARMACY		**ACADEMIC SESSION: 2023 – 2024**	**FOR STUDENTS': D.PHARMACY I**
1	**Course No.**	DP-II	**Name of faculty – Harshvardhan Singh Rathore**
2	**Course Title**	BIOCHEMISTRY & CLINICAL PATHOLOGY	
3	**Credits**	**4**	
4	**Learning Hours**	Contact Hours 75	
5	**Course Objective**	This course will discuss the following at the fundamental level 1. Structure and functions of biomolecules 2. Catalytic activity, diagnostic and therapeutic importance of enzymes 3. Metabolic pathways of biomolecules in health and illness (metabolic disorders) 4. Biochemical principles of organ function tests and their clinical significance 5. Qualitative and quantitative determination of biomolecules / metabolites in the biological sample 6. Clinical pathology of blood and urine	
6	**Course Outcomes**	Upon successful completion of this course, the students will be able to 1. Describe the functions of biomolecules 2. Discuss the various functions of enzymes in the human system 3. Explain the metabolic pathways of biomolecules in both physiological and pathological conditions 4. Describe the principles of organ function tests and their clinical significances 5. Determine the biomolecules / metabolites in the given biological samples, both qualitatively and quantitatively 6. Describe the clinical pathology of blood and urine	
7	**Outline syllabus:**		

7.01	**Paper Code**	**Unit**	**Introduction**	**Page Numbers[1]**	**Lectures**
7.02	**ER20-11T Unit I**	(a)	Introduction to biochemistry: Scope of biochemistry in pharmacy; Cell and its biochemical organization.	1-9	2
7.03	**ER20-11T Unit II**	(a)	Carbohydrates Definition, classification with examples, chemical properties Monosaccharides - Structure of glucose, fructose, and galactose Disaccharides - structure of maltose, lactose, and sucrose Polysaccharides - chemical nature of starch and glycogen Qualitative tests and biological role of carbohydrates	16-17	5
7.04	**ER20-11T Unit III**	(a)	Proteins Definition, classification of proteins based on composition and solubility with examples Definition, classification of amino acids based on chemical nature and nutritional requirements with examples Structure of proteins (four levels of organization of protein structure) Qualitative tests and biological role of proteins and amino acids Diseases related to malnutrition of proteins.	26-28	5

7.05	**ER20-11T Unit IV**	(a)	Lipids Definition, classification with examples Structure and properties of triglycerides (oils and fats) Fatty acid classification - Based on chemical and nutritional requirements with examples Structure and functions of cholesterol in the body Lipoproteins - types, composition and functions in the body Qualitative tests and functions of lipids	44-48	5

7.06	**ER20-11T Unit V**	(a)	Nucleic acids • Definition, purine and pyrimidine bases • Components of nucleosides and nucleotides with examples • Structure of DNA (Watson and Crick model), RNA and their functions	48-54	4
7.06	**ER20-11T Unit VI**	(a)	Enzymes • Definition, properties and IUB and MB classification • Factors affecting enzyme activity • Mechanism of action of enzymes, Enzyme inhibitors • Therapeutic and pharmaceutical importance of enzymes	55-60	5
7.7	**ER20-11T Unit VII**	(a)	Vitamins • Definition and classification with examples • Sources, chemical nature, functions, coenzyme form, recommended dietary requirements, deficiency diseases of fat-and water-soluble vitamins	61-66	6
7.8	**ER20-11T Unit VIII**	**(a)**	Metabolism (Study of cycle/pathways without chemical structures) • Metabolism of Carbohydrates: Glycolysis, TCA cycle and glycogen metabolism, regulation of blood glucose level. Diseases related to abnormal metabolism of Carbohydrates • Metabolism of lipids: Lipolysis, β-oxidation of Fatty acid (Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver, Hypercholesterolemia • Metabolism of Amino acids (Proteins): General reactions of amino acids and its significance– Transamination, deamination, Urea cycle and decarboxylation. Diseases related to abnormal metabolism of amino acids, Disorders of ammonia metabolism, phenylketonuria, alkaptonuria and Jaundice. • Biological oxidation: Electron transport chain and Oxidative phosphorylation.	67-73	20
7.9	**ER20-11T Unit IX**	**(a)**	Minerals: Types, Functions, Deficiency diseases, recommended dietary requirements	74-82	5
8	**ER20-11T Unit -X**	**(a)**	Water and Electrolytes • Distribution, functions of water in the body • Water turnover and balance • Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance • Dehydration, causes of dehydration and oral rehydration therapy	83-90	05

8.1	**ER20-11T Unit -XI**	**(a)**	Introduction to Biotechnology	91-93	01
8.2	**ER20-11T Unit -XII**	**(a)**	Organ function tests • Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances • Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances • Lipid profile tests and its clinical significances	94-101	06
8.3	**ER20-11T Unit -XII**		Introduction to Pathology of Blood and Urine • Lymphocytes and Platelets, their role in health and disease • Erythrocytes - Abnormal cells and their significance • Normal and Abnormal constituents of Urine and their Significance.	102-110	06
8.4	**Course Evaluation**				
8.5	**Internal Assessment: Continuous Mode**				
8.6	**Attendance**	75 Marks			
9	**Text Books & References**				
9.1	**Text book**	Dr. Kailash R. Biyani			
9.2	**References**	1. Indian pharmacopoeia.			