

**CHOICE BASED CREDIT SCHEME AT UNDER-GRADUATE LEVEL  
COURSE STRUCTURE OF B. Sc. WITH CLINICAL BIOCHEMISTRY**

SEM	COURSE CODE	COURSE TYPE	TITLE OF COURSE	CREDITS	
				THEORY	PRACTICAL
I	<b>CLB120C</b>	DSC-1	BIOMOLECULES- METABOLISM AND RELATED DISORDERS	4	2
II	<b>CLB220C</b>	DSC-2	CLINICAL IMMUNOLOGY AND MICROBIOLOGY	4	2
III	<b>CLB320C</b>	DSC-3	CELL AND MOLECULAR BIOLOGY	4	2
IV	<b>CLB420C</b>	DSC-4	ORGAN FUNCTION AND RELATED DISORDERS	4	2
VA OR VB	<b>CLB520DA</b>	DSE-1A	CLINICAL BIOCHEMISTRY AND ENZYMOLOGY	4	2
	<b>CLB520DB</b>	DSE-1B	CLINICAL HAEMATOLOGY	4	2
VIA OR VIB	<b>CLB620DA</b>	DSE-2A	CLINICAL PATHOLOGY	4	2
	<b>CLB620DB</b>	DSE-2B	BIO-ANALYTICAL TECHNIQUES	4	2

**BACHELOR OF SCIENCE (GENERAL)  
1<sup>st</sup> SEMESTER**

**DISCIPLINE SPECIFIC COURSE (CORE)**

**CLB120C: CLINICAL BIOCHEMISTRY: BIOMOLECULES- METABOLISM AND RELATED DISORDERS**

**THEORY (4 CREDITS: 60 HOURS)**

**CREDITS: THEORY – 4, PRACTICAL – 2  
MAXIMUM MARKS: 60, MINIMUM MARKS: 24**

***Objectives and Expected Learning Outcomes:***

*To acquaint the students with basic understanding of the structure and properties of macromolecules that interact to maintain and perpetuate the living systems. Knowledge on the structure and function of different biomolecules would enable the students to consolidate their focus on understanding various metabolic pathways crucial for the sustenance of living systems.*

**UNIT-1 (15 Hours)**

Chemistry of Carbohydrates: Definition, classification and structure of monosaccharides and important polysaccharides; Metabolism of Carbohydrates - Glycolysis, Krebs cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogenesis, Glycogenolysis; Regulation of carbohydrate metabolism. Inborn errors of carbohydrate metabolism

**UNIT-2 (15 Hours)**

Chemistry of Amino acids and Proteins: Structure, classification, properties and functions; Peptide bond, secondary, tertiary, quaternary structure; Metabolism of Amino acid: Transamination, oxidative deamination, Urea cycle, Degradation of amino acids like tryptophan, tyrosine, methionine cysteine Inborn errors of amino acid metabolism

**UNIT-3 (15 Hours)**

Chemistry of Lipids: classification, structure, properties and functions of fatty acids, triacylglycerol, phospholipids, sterols, lipids with special biological functions. Lipid metabolism: Biosynthesis and degradation of saturated and unsaturated fatty acids, ketone bodies and cholesterol. Disorders of lipid metabolism

**UNIT-4 (15 Hours)**

Chemistry of Nucleic acids: structure and properties of purines and pyrimidine bases, nucleoside and nucleotides, conformation of nucleic acids, stability of nucleic acid structure. Nucleic Acid metabolism: Biosynthesis and degradation of purines and pyrimidines; Regulation of purines and pyrimidine biosynthesis, Disorders of purine / Pyrimidine metabolism.

**PRACTICAL (2 CREDITS: 60 Hours)    MAXIMUM MARKS: 30, MINIMUM MARKS: 12**

- 1) Preparation of standard Buffers and determination of pH of a solution.
- 2) Principle, working and maintenance of pH meter and Weighing balance
- 3) Biochemical calculations – Molarity, Molality, Normality, percent solution
- 4) Qualitative tests for Carbohydrates – Molisch, Fehling's, Benedict's test
- 5) Qualitative tests for Proteins and Amino acids
- 6) Quantitative estimation of carbohydrates
- 7) Quantitative estimation of proteins by Lowry's method