

ALLIED BIOCHEMISTRY- I

Sem	Subject Code	Category	Lecture		Theory		Practical		Credits
			Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
I	21CABC1A	Allied	4	60	4	60	-	-	4

COURSE OBJECTIVE:

To enable the students to learn and comprehend the structure, properties and functions of biomolecules.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to -

CO Number	CO Statement	Knowledge Level (K ₁ – K ₄)
CO1	Understand and relate the carbohydrate, its types, structure and properties	K2
CO2	Students will analyze structural-functional relationships of aminoacids	K4
CO3	Provides a clear knowledge on the different levels of protein structure and their interdependence	K2
CO4	Provide an understanding of characteristics for each type of lipid and several major functions of lipids.	K4
CO5	Understand the composition and roles of <i>nucleic acids</i> in the cell and distinguish between its different types .	K1

(*CO – Course Outcomes)

Knowledge Level: K₁ – Remember; K₂ – Understand; K₃ – Apply; K₄ – Analyze).

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	S	M	S	M
CO2	S	S	M	M	S	S
CO3	M	M	M	S	M	S
CO4	S	M	S	S	M	M
CO5	M	S	S	M	S	S

(S- Strong; M-Medium; L-Low)

UNIT I

Total Hours :60

Chemistry of Carbohydrates

15 hours

Classification of carbohydrates, Monosaccharides : Linear and ring forms of Glucose and Fructose, Mutarotation. Disaccharides: occurrence, structure, physical properties of Maltose, Sucrose and Lactose. Polysaccharides: Starch and Cellulose - Occurrence, structure, physical properties.

UNIT II

Chemistry of Aminoacids.

10 hours

Amino acids -Definition, General structure of amino acids, classification of amino acids, physical properties of amino acids, Isoelectric point, Isoelectric pH and Zwitter ion. Chemical properties- Reaction with Ninhydrin, 1-Fluoro-2, 4-dinitrobenzene (FDNB) reaction

UNIT III

Chemistry of Proteins

15 hours

Classification of proteins based on solubility, size and shape, Peptide bond - Formation of peptide bond, Physical properties of proteins - Salting in and Salting out, Denaturation and renaturation of proteins, Structure of protein: primary, secondary, tertiary and quaternary levels of organization.

UNIT IV

Chemistry of Lipids

10 hours

Definition, classification and functions of lipid, Fatty acids- Saturated fatty acids: Butyric, arachidic and stearic acid. Unsaturated fatty acids: Oleic, Linoleic and linolenic acid. cholesterol- structure and biological significance. Structure and functions of phospholipids- sphingomyelin. Characterization of fat- Emulsification, Saponification, Acid number, Rancidity, Iodine number and Reichert- Meissl number. Bile acid, Bile salt and its functions.

UNIT V

Chemistry of Nucleic acids

10 hours

Nucleic acids - Definition, composition, nucleoside, nucleotide and polynucleotide. Double helical model of DNA. Structure of RNA: tRNA, mRNA and rRNA and its biological functions. Differences between DNA and RNA.

DISTRIBUTION OF MARKS: Theory - 100% and Problems – Nil

TEACHING METHODOLOGY:

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

TEXT BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	U.Satyanarayana, U.Chakrapani	Biochemistry	Books and Allied (P) Ltd	2010

REFERENCE BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	J. L. Jain	Fundamentals of Biochemistry	S Chand	2016
2.	Anil Chandra Deb	Fundamentals of Biochemistry	New Central Book Agency (p) Ltd	2001
3.	David L. Nelson <u>Michael Cox</u>	Lehninger Principles of Biochemistry	Cox-CBS Publishers	2017

4.	Murray R K	Harper's illustrated Biochemistry	P.A. Mayes and U.W.Rodwell -Lange Medical publications	2006
5.	Chatterjee	Textbook of Medical Biochemistry	Jaypee Brothers Medical Publishers (P) Ltd	2012

WEB SOURCES:

- [https://en.wikibooks.org/wiki/Structural Biochemistry/Organic Chemistry/Carbohydrate_s](https://en.wikibooks.org/wiki/Structural_Biochemistry/Organic_Chemistry/Carbohydrate_s)
- <http://themedicalbiochemistrypage.org/carbohydrates.html>
- https://en.wikibooks.org/wiki/Category:Book:Structural_Biochemistry

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