ALLIED BIOCHEMISTRY- II

Sem	Sub Code	Category	Lecture		Theory		Practical		Credits
			Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
II	21CABC2A	Allied	4	60	4	60	-	-	4

COURSE OBJECTIVE:

To enable the students to learn metabolism and metabolic disorders, structure and biological functions of enzymes, vitamins and minerals.

COURSE OUTCOMES:

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

CO Number	CO statement	Knowledge level (K1-k4)
CO1	Provides a deeper insight into the fundamentals of metabolism and various metabolic reactions.	K1
CO2	Students will assess and apply the knowledge of applications of the instruments commonly used in the laboratories.	K4
CO3	Students will acquire knowledge on the role and the mechanisms of action of enzymes.	K2
CO4	Provide an understanding of characteristics for each type of lipid and several major functions of lipids.	K2
CO5	Understand the potential benefits and role of vitamins, minerals and their major functions and distinguish between its different types .	K3

(*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**

Metabolism **15 hours**

Metabolism - Definition, Types of metabolic pathways-catabolism, anabolism and amphibolism with example. Glycolysis-pathway, Fate of pyruvate under aerobic and anaerobic conditions, TCA cycle, Transamination reaction, significance of SGOT and SGPT.

UNIT II

Analytical Techniques **10 hours**

Units of measurement of solutes in solution-normality, molality, molarity, Isotonic, hypertonic and hypotonic solutions, Osmosis, Osmotic pressure, Applications of Osmosis, Definition - pH, pOH, buffer and buffer capacity, Buffers in body fluids, Henderson Hesselbalch equation. Paper chromatography, Gel permeation chromatography - Principle and applications.

UNIT III

Enzymes **10 hours**

Enzymes - Definition, enzyme units, Active site, Nomenclature and Classification of enzymes. Mechanism of enzyme action - Lock and key theory, Induced fit theory. Factors affecting enzyme activity: pH, Temperature and Substrate concentration. Isoenzyme: Definition with one example (LDH), Michaleis - Menton equation. Enzyme Inhibition: Competitive, Uncompetitive, and Non competitive inhibition.

UNIT IV

Molecular Biology **15 hours**

Central dogma, Replication and its types- Process of Replication and Transcription, Protein synthesis- Initiation, Elongation and Termination. Genetic code - Definition, characteristics of genetic code, DNA as genetic material - Experimental evidence-Griffth, Avery, Herschey-chase experiments.

UNIT V

Vitamins and Minerals **10 hours**

Vitamins - Classification, sources, and biological functions, Minerals: Essential macro minerals and essential micro minerals, sources and functions (Iron, copper, Potassium, Phosphorous, Calcium).

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.	Murray R K	Harper's illustrated Biochemistry	P.A. Mayes and U.W.Rodwell -Lange Medical publications	2006
2.	Nicholas C. Price and Lewis stevens	Fundamental of Enzymology	Oxford University Press	1999
3.	David L. NelsonMichael Cox	Lehninger Principles of Biochemistry	Cox-CBS Publishers	2017

4.	Chatterjee	Textbook of Medical Biochemistry	Jaypee brothers medical Publishers (p) Ltd	2012
5.	AvinashUpadhyaye and NirmalendheNath	Biophysical chemistry Principles and Techniques	Himalaya Publishers	2009

WEB SOURCES:

- https://en.wikibooks.org/wiki/Category:Book:Biochemistry
- https://en.wikipedia.org/wiki/Nucleic_acid_structure
- https://www.helpguide.org/harvard/vitamins-and-minerals.htm

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