BIOCHEMISTRY

Semester	Subject Code	Category	Lecture		Theory		P	C
I	21CABC1B	Allied - I	5 hrs Per week	75	5 hrs Per week	75	0	4

COURSE OBJECTIVE:

- To understand the structure of biomolecules, metabolism and their functions and the energy to flow in biological system and catalytic functions of enzymes

COURSE OUTCOMES: Up on successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL (K1-K4)
CO1.	To describe the structure and interactions in aqueous solutions and understand about body fluids	K1, K2
CO2.	Identify and interpret the structure, classification, of carbohydrates, amino acids and lipids	K2
CO3.	To understand analyze metabolism of carbohydrates and proteins.	K2, K4
CO4.	To know about bioenergetics and understand the functions of enzymes and classification	K2
CO5.	To understand the structure and classification of vitamins	K2

Knowledge level: K1- Remember; K2- Understand; K3- Apply; K4- analyze

MAPPING WITH PROGRAMME OUTCOMES

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

S-strong; M- medium; L-low

UNIT 1: Biological Fluids **15 Hours**

Water – Biological importance, physical properties, structure, Interactions in aqueous solution; pH and buffers- Acid – Base balance, Biological importance of Buffers, Acidiosis and alkalosis. Electrolyte and water balance.

Body fluids – Milk, Colostrum, amniotic fluid and CSF

UNIT 2: Biomolecules **15 Hours**

Carbohydrates – Classification of carbohydrates – Structure and properties of mono, di and polysaccharides in plants, cellulose, starch and pectins.

Amino Acids: Structure, Classification of amino acids and properties. Proteins: structure classification and properties Nucleic acids – structure of phosphoric acid, pentose sugar, nucleotides.

Lipids – Classification of lipids. Structure and properties of fatty acids, fatty oil, Glycerolipids, phospholipids, sphingolipids, glycolipids, and steroids.

UNIT 3: Metabolism **15 Hours**

Digestion of carbohydrates – Glycolysis, TCA Cycle, HMP shunt, Oxidative phosphorylation. Digestion of lipids – beta – oxidation of fatty acids.

Digestion of proteins – Transamination, oxidative and non oxidative deamination – Mechanism of photosynthesis

UNIT 4: Bioenergetics & Catalysis **15 Hours**

Bioenergetics – Free energy, laws of thermodynamics – enthaphy and entrophy – redox potential.

Enzyme – Definition and classification, active site, apoenzyme, coenzyme and isoenzyme, mechanism of enzyme action.

UNIT 5: Vitamins and Deficiency **15 Hours**

Water and Lipid soluble Vitamins – Structure, classification, sources and deficiencies in man.

TEACHING METHODOLOGY:

- Class room teaching
- Assignments
- Discussions
- Homework

- PPT presentations
- Seminars
- Models and charts

TEXT BOOKS:

S.no.	Authors	Title	Publishers	Year of publication
1.	J.L. Jain	Fundamentals of Biochemistry	S. Chand & Company, Limited	2016
2.	A.C. Deb	Fundamentals of Biochemistry	New Central Book Agency (P) Ltd	2017
3.	G. Zubay	Biochemistry	Macmillan Publishing Co, New York	2010

REFERENCE BOOKS:

S.No.	Authors	Title	Publishers	Year of publication
1.	A.L. Lehninger., D.L Nelson and M.M. Cox	Principles of Biochemistry	Worth Publishers, New York	2016
2.	L. Stryer	Biochemistry	W.H. Freeman and Company	2012
3.	D. Voet& J.G. Voet	Biochemistry	Hoboken, N.J:J. Wiley & Sons	2016

WEB SOURCES:

1. http://www.biologydiscussion.com/metabolism/carbohydrates-metabolism/metabolism-of-carbohydrates-10-cycles-with-diagram/11242
2. https://nptel.ac.in/courses/112105129/pdf/RAC%20Lecture%204.pdf
3. http://ocw.ump.edu.my/pluginfile.php/9893/mod_resource/content/1/Nucleic%20Acid%20Metabolism.pdf
4. http://elearning.vtu.ac.in/moodle2/pluginfile.php/101/mod_folder/content/0/10BT43/Biomolecular%20%20%20Interactions.pdf?forcedownload=1

Syllabus Designer:

- Dr. C. Suganthi
  Assistant Professor