

OBJECTIVES : The students will be able to :

- Describe the basic chemical structures carbohydrates and lipids and their general functions and characteristics.
- Classify proteins, nucleic acids and porphyrins
- Identify the reactions of various functional group of proteins, nucleic acids and porphyrins.
- Apply theory based tools to solve simple biochemical problems related to subject areas.

COURSE :

UNIT I : **Amino acids** : Introduction, Amino acids : common structural features, stereo-isomerism and RS system of designating optical isomers, physical and chemical properties, titration curve of amino acids . Essential amino acids.

UNIT II : **Peptides** : Structure of peptide bond, chemical synthesis of polypeptides – protection and deprotection of N-terminal, and C-terminal ends and functional groups in the side-chains, Merrifield solid-phase peptide synthesis. Determination of amino acid sequence of a polypeptide chain, specific chemical and enzymatic cleavage of a polypeptide chain and separation of peptides.

UNIT III : **Protein** : Introduction, classification based on solubility, shape, composition and functions. Protein Structure: levels of structure in protein architecture, primary structure of protein, secondary structure of proteins – helix and pleated sheets, tertiary structure of protein, forces stabilizing the tertiary structure and quaternary structure of proteins. Denaturation, renaturation of proteins. Behaviour of proteins in solution, salting in and salting out of proteins. Structure and biological functions of fibrous protein (keratins, collagen and elastin) , globular protein (hemoglobin, myoglobin), lipoproteins, metalloproteins, glycoproteins and nucleoproteins.

UNIT IV :Nucleic acids : Nature of genetic material; Composition of RNA and DNA , generalized structural plan of nucleic acids, nomenclature used in writing structure of nucleic acids, features of DNA double helix. Denaturation and annealing of DNA, structure and roles of different types of RNA. Types of DNA. Central dogma of molecular biology.

UNIT V :Porphyrins :Porphyrin nucleus and classification of porphyrins. Important metalloporphyrins occurring in nature . Detection of porphyrinspectrophotometrically and by fluorescence. Bile pigments – chemical nature and their physiological significance.

REFERENCES :

1. Rama Rao, A.V.S.S. (1989) Text Book of Biochemistry, L.K.&S Publishers, Visakhapatnam .
2. Comn, E.E. and Stump, P.K. (1989) Outline of Biochemistry. Wiley Eastern Ltd., New Delhi.
3. Kleiner, I.S. and Orten, J.M. (1979) Biochemistry . C.V.Mosby& Co., St Louis.
4. Swaminathan, M (1981) Biochemistry For Medical Students, Geeta Book House Publishers, Mysore.
5. Kuchel, P.W. and Ralston, G.B.(1988) Theory And Problems Of Biochemistry, Mc Graw Hill Book Co., New York.

ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM
III SEMESTER
BCH 3850 (1)
w.e.f 2008-2011(V batch)

BIOCHEMISTRY
BIOMOLECULES – II - Practical

TIME: 4 Hrs/Week
Max. Marks: 50

OBJECTIVES: The students will be able to:

- Interpret experimental/investigative data.
- Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.
- Apply theory based tools to solve simple Biochemical problems related to subject areas.
- Work in a laboratory with selected experimental techniques and methods which are applied in Biochemical experiments.
- Communicate knowledge about problem areas within Biochemical subject areas in writing.

COURSE:

1. Qualitative Examination of Proteins and Amino acids.
2. Estimation of proteins –
 - a. Kjeldahl determination
 - b. Biuret Assay
 - c. Folin – Lowry Method
3. Titration curve for amino acids and determination of pk value.
4. Estimation of amino acids by ninhydrin method.
5. Estimation of DNA by DPA method.
6. Estimation of RNA by Orcinol method.
7. Separation of amino acids using paper chromatography.
8. Isolation of albumins from egg white.

REFERENCES:

1. Plummer, D.T. (1979) **An Introduction to Practical Biochemistry**, Tata MC Graw Hill Book Co., Bombay.
2. Oser, B.L.(1961) **Hawk's Physiological Chemistry**, Tata MC Graw Hill Book Co. Bombay.
3. Burtis, C.A & Ashwood E.R(Eds) (V Edn) Tietz Fundamentals of Clinical Biochemistry . WBSaunders & Co. New York.

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