

NUTRITIONAL BIOCHEMISTRY

Semester – 5th

CC – 11

FN (501)

Credit – 2 + 2 = 4

Objectives :-

This course will enable the students to.

1. Develop an understanding of the principles of biochemistry (as applicable to human nutrition)
2. Obtain an insight into the chemistry of major nutrients and physiologically important compounds.
3. Understand the biological processes and system as applicable to human nutrition.
4. Apply the knowledge required to human nutrition and dietetics.

UNIT – 1 Introduction to Biochemistry. – Definition, Objectives, Scope and Inter relationship between biochemistry and other biological sciences.

UNIT – 2 (A) Introduction to carbohydrates, Lipids and Proteins.

(B) Enzymes – Definition, Types and Classification of enzymes, definition and types of co – enzymes, specificity of enzymes, Isozymes, Enzyme kinetics including factors affecting velocity of enzyme catalyzed reactions, enzyme inhibition.

UNIT – 3 Molecular aspect of transport – Passive.

(A) Diffusion, Facilitated diffusion, Active transport.

(B) Intermediately metabolism – general consideration carbohydrates glycolysis, blood sugar regulation.

- Lipids – Oxidation and biosynthesis of fatty acids, Synthesis and utilization of ketone bodies, Ketosis, Fatty liver.

- Proteins – general reaction of amino acid metabolism, urea cycle.

UNIT – 4 (A) Biological oxidation – citric acid cycle, electron transport chain.

(C) Oxidative phosphorylation, energy conservation, high energy phosphate bond.

Practical :

1. Carbohydrates.

- Reaction of mono, di, and polysaccharides and their identification in unknown mixtures.
- Estimation of reducing and total sugars in foods.

2. Fats.

- Reaction of fats and oils.
- Determination of Acid value, Saponification and Iodine number of natural fats and oil

3. Proteins.

- Reaction of proteins in foods.
- Reaction of amino acids and their identification in unknown mixtures.
- Estimation of total N of foods by Kjeldahl method.

References – Theory.

- West. E.S.Todd, W.R., Mason H.S. and Van Bruggen, J.T. (1974) 4th Ed. Text book of biochemistry, Amerind Publishing co pvt. Ltd.
- While, A., Handlar P., Smith E.L.Stelten D.W. (1954): 2nd Ed. Principles of Bio-chemistry, Mc GrawHill Book co.
- Lehninger, A.L. Nelson, D.L. and Cox. M.M. (1993): 2nd Ed, Principles of Bio-Chemistry BS Publishers and distributors.
- Devlin T.M. (1986) : 2nd Ed. Text book of Biochemistry with Clinical Correlations, John wiley and sons.

References – Practical.

- Oser, B.L. (1965) : 14th Ed. Hawk's Physiological chemistry, Mc Graw Hill Book Co.
- William.S: 16th Ed. JAOAC, official analytical chemicals.
- Indian Standards Institution, (1985) : ISI hand book of food analysis, Parts I to XI, Manak Bhawan, New Delhi.
- Varley, H. Gowenlock, A.H. and Bell.M. (1980) : 5th Ed. Practical and clinical chemistry. Vol. I William Heinemann medical books ltd.
- Sundararaj, P and Siddhu, A., (1995) : Qualitative tests and quantitative procedures in Bio-chemistry – a practical manual, Wheeler Publishing.