ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM
IVSEMESTER **HOMESCIENCE** TIME: 4HRS/WEEK
HS4203 (3) **NUTRITIONAL BIOCHEMISTRY** MAX.MARKS:100
w.e.f. 2020 –2021("20AH") **SYLLABUS**

OBJECTIVES: To enable the student to
• Understand the relationshipbetweenBiochemistry and Nutrition.
• Understand the chemistry , digestion, absorption and metabolism of nutrients in health.

OUTCOMES OF THE COURSE: On completion of the Course, the student shall
1. Gain depth knowledge on human metabolism.
2. Understand and experiment on the principles of bio-chemical methods.
3. Be able to demonstrate through scientific experiments chemistry of nutrients.
4. Be qualified to take up career relating bio-chemistry with nutrition for extensive application.

THEORY

UNIT-IINTRODUCTION TO BIOCHEMISTRY AND CARBOHYDRATES:

- Introduction to Biochemistry – Some aspects of Physical and Organic Chemistry - Acids, Bases, Hydrogen Ion Concentration – PH, Buffers and Chemical Bonds.
- Chemistry of carbohydrates
- Classification – Monosaccharides- Structural Aspects – isomers, epimers, anomers and mutarotation and reactions of Monosaccharide's
- Disaccharides and Polysaccharides & reactions of Carbohydrates.

UNIT-II LIPIDS AND PROTEINS:

- Chemistry of Lipids, Classification of Fatty Acids, Classification and Properties of Lipids, Structural Lipids-Phospholipids, Glycolipids, Lipoproteins and Cholesterol.
- Chemistry of Proteins-Definition, Classification, Structures of amino acids and Reactions of Amino Acids, Definition, Properties and Classification of Proteins.

UNIT III ENZYMES AND CO-ENZYMES:

- Enzymes – Definition, Properties, Classification, Enzyme Specificity, Enzyme Action, Inhibition and Factors effecting Enzyme Activity.
- Co enzymes – Vitamins as co enzymes.

UNIT-IV METABOLISM OF CARBOHYDRATES:

- Introduction to Metabolism – Catabolism and anabolism.
- Metabolism of Carbohydrates– Utilization of glucose after absorption, Homeostasis of glucose – Role of liver and Hormones in regulation of blood glucose level, Glucose Tolerance Test.
- Anaerobic and aerobic metabolisms of Carbohydrates - Glycolysis and Kreb's cycle.

UNIT-V METABOLISM OF LIPIDS AND PROTEINS:

- Metabolism of Lipids – Role of Adipose tissue and Liver in Lipid metabolism, Beta oxidation and bio synthesis of fatty acids.
- Metabolism of Amino acids – Deamination, Transamination, Decarboxylation of amino acids and Urea cycle.
- Integration of Carbohydrate, protein and Lipid metabolism.

REFERENCE BOOKS:

1. Rama Rao, A.V.SS. (2015) A Text book of Biochemistry, 6th edition, UBSPD publications.
2. Singh S.P., (2011), Principles of Biochemistry, CBS Publishers.
3. Satyanarayana, U. (2000). Biochemistry, 2nd edition, Uppala Author publishers.
4. Dulsy Fatima, Dr. L.M. Narayanan (2005). Biochemistry, 1st edition, Saras publications.

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