ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

IV SEMESTER **HOMESCIENCE** TIME: 4HRS/WEEK

HS 4203 (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-I: INTRODUCTION 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.

HS 4203 (3) ::2::

**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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ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

IV SEMESTER **HOMESCIENCE** TIME:2HRS/WEEK

HS 4253 (2) **NUTRITIONAL BIOCHEMISTRY**  MAX.MARKS:50

w.e.f. 2020 –2021(“20AH”) **PRACTICALSYLLABUS**

**OBJECTIVES:**

To enable the student to –

• Understand the chemistry of nutrients.

• Learn the principles and procedure of food and biochemical analysis.

**OUTCOMES OF THE COURSE:**On completion of the Course, the student shall

1. Be able to evaluate presence of nutrients in various foods.

2. Get acquainted with various food analysis techniques.

3. Gain an understanding of the entrepreneurial avenues in food analysis

4. Develop an interest in pursuing the course at the Master’s level.

**COURSE:**

1. Preparation of acids, bases, buffers, measuring pH.
2. Qualitative analysis – Identification of carbohydrates
3. Qualitative analysis – Identification of proteins and amino acids
4. Qualitative analysis of Lipids.
5. Qualitative analysis of food enzymes – plant and animal.

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