

2-19

**BSC APPLIED NUTRITION & PUBLIC HEALTH I YEAR**

**I SEMESTER**

**BS104 DISCIPLINE SPECIFIC COURSE IA- (DSC IA)**

**BASICS OF BIOCHEMISTRY**

**CREDITS 4**

**60 HOURS**

**UNIT 1- INTRODUCTION TO NUTRITION & CARBOHYDRATES**

**16 HOURS**

1.1 Introductory Nutrition, Definition of Nutrition, Food, Nutrients, or Proximate Principles, Nutritional needs of body, specific role of nutrients, classification of foods, food groups.

1.2 **Carbohydrates** — Composition and chemistry, classification, sources, nutritional significance, digestion, absorption and metabolism - Glycolysis, TCA Cycle with bioenergetics.

**Unit II- PROTEINS & NUCLEIC ACIDS**

**18 HOURS**

2.1 **Proteins:** Composition and chemistry, classification sources, functions, digestion and absorption, denaturation. Nutritional significance of some amino acids. General properties of proteins, metabolism, deamination, transamination, decarboxylation. Outlines supplementary value of amino acids. Deficiency of Protein — PEM definition, classification, and age groups affected

2.2 **Nucleic acids:** Composition — purine and pyrimidine bases DNA, RNA — structure and biological functions

**Unit III- LIPIDS**

**14 HOURS**

3.1 Composition Chemistry classification- simple, compound & derived lipids with functions, cholesterol functions & ranges

3.2 sources, chemical properties.

3.3 Digestion and Absorption,

3.4 Essential fatty acids-omega3 & omega 6: functions and deficiency,

3.5 Elements of fat analysis, Metabolism: Beta- oxidation of fatty acids. Types of Rancidity, Ketosis

**Unit IV-ENERGY METABOLISM**

**12 HOURS**

4.1 Types of energy, energy yielding food factors, RDA & factors affecting RDA, energy units.

4.2 Principle of direct & indirect calorimetry

4.3 Determination of energy value of food using bomb calorimeter.

4.4 PFV (Physiological Fuel Value) of foods, RQ, SDA of food.

4.5 Determination of BMR and factors affecting BMR

## REFERENCE BOOKS

- ✓ Nutrition science- B srilashmi, New age international publishers, 2<sup>nd</sup> edition.
- ✓ A textbook of biochemistry, Dr. AVSS Rama Rao, 10<sup>th</sup> edition, UBS publishers Distribution pvt. Ltd.
- ✓ Biochemistry- U satyanaraya, U chakrapani, Books and Allied (P.Ltd)
- ✓ Helen A. Guthrie, Introductory Nutrition, Times Mirror Mosby
- ✓ Swaminathan M, Advance Textbook on Food and Nutrition, Volume 1, The Bangalore printing and publishing co.,Ltd.
- ✓ Mudambi SR and Rajagopal M V, Fundamentals of food and Nutrition, Willey Eastern Ltd.
- ✓ Swaminathan M, Handbook of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.

**B.Sc. I year - SEMESTER II (Theory)**

**Nutritional Biochemistry 2**

**Code BS 204, DSC 1B**

**60 hours**

**4 hour/ week, credits 4**

**Unit I**

**20 hours**

Vitamins : Fat soluble – A,D,E,K . History, Chemistry, physiological functions, sources, requirements, effects of deficiency.

Water soluble vitamins – B Complex – Thiamine, Riboflavin, Niacin, Pantothenic Acid, Folic Acid, Vitamin B12, Biotin and Pyridoxine, Vitamin C. History, requirements, functions, sources, effect of deficiencies.

**Unit II**

**16 hours**

Macro and Micro Minerals – Calcium, Phosphorous, Iron, Fluorine, Iodine. History, Chemistry, physiological functions, sources, requirements, deficiency. Role of Zinc and Selenium as antioxidants.

**Unit III**

**12 hours**

Water balance and electrolyte balance – regulation of water balance, abnormalities of water balance, water compartments in the body. Japanese Water Therapy.

**Unit IV**

**12 hours**

Enzymes – Definition, classification, properties, mechanism of enzyme action, factors affecting enzyme action, enzyme inhibitions.

Hormones – Major endocrine glands and their secretions, classification, general mode of action – Insulin, Thyroxin,

**Suggested readings:**

- ✓ Nutrition science – B Srilakshmi, New age international Publishers, 2<sup>nd</sup> edition.
- ✓ A text book of biochemistry, Dr. AVSS Rama Rao, 10<sup>th</sup> edition, UBS publishers Distribution pvt. Ltd.
- ✓ Biochemistry- U Satyanarayana, U chakrapani, Books and Allied(P. Ltd.)
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