

V - SEMESTER
NUTRITIONAL BIOCHEMISTRY-(Course No-5)

Credits -3

Course Objectives:

1. To compile various Nutrition and balanced diet, various dietary requirements of nutrients.
2. To acquire knowledge about protein calorie malnutrition
3. To revise the facts about Fat- and Water-soluble vitamins and their importance. 5. To extract facts about Obesity and various lifestyle associated diseases

UNIT- I

Animal and vegetative foods – chemical composition. Nutrients – Essential Nutrients and their classification. Digestibility, absorption and biochemical functions of macro nutrients, Carbohydrates – dietary requirements. Proteins – Nitrogen balance studies, Determination of Biological values of proteins, Specific Dynamic Action, improvement of protein quality by supplementation and fortification. Lipids – Dietary needs of lipids, essential fatty acids. Calorific values of foods, Basal metabolic rate and its determination, factors influencing BMR.

UNIT-II

Clinical nutrition – role of diet and nutrition in prevention of atherosclerosis and obesity, role of leptin in regulation of body mass. Starvation – Protein sparing treatment during fasting, Protein calorie malnutrition – Kwashiorkor and Marasmus, Nutritional requirements for pregnant and lactating women and aged people.

UNIT-III

Biological effects of non-nutrients, dietary fibre, physiological actions. Antinutrients – Protease inhibitors, hemagglutinins, hepatotoxin, goitrogens, cyanogenic glucosides, methyl xanthines, oxalates. Toxins from mushrooms. Biological effects of food contaminants – Hexachlorobenzene, arsenic, DDT, cadmium, mercury, lead, aflatoxins, food additives - saccharin and sodium nitrite. Animal foods and seafoods. Food allergy – role of allergens, diagnosis and management of food allergy. Food processing and loss of nutrients during processing and cooking.

UNIT-IV

Vitamins – Fat soluble vitamins (A,D,E,K) and Water soluble vitamins (B complex and C) (Sources, biological functions and RDA), Disorders of vitamins A, D, E, K, Vitamin C and B-complex vitamins : Thiamin, Riboflavin, Niacin, Pantothenic acid, Lipoic acid, Pyridoxine, Biotin, folic acid and vitamin B12. Minerals- iron, calcium, iodine, selenium (Sources, biological functions and RDA). Deficiency disorders of minerals Nutritional requirements in infancy, childhood, pregnancy and lactation and old age.

UNIT- V

Obesity – Causes, Anthropometric measurements and Diet management. Dietary management in – Infection, Fever, Constipation, Diabetes mellitus, Peptic Ulcer, PCOS, Hypertension, Cardiovascular diseases, Pancreatitis, Cirrhosis and Cancer.

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Credits -1

PRACTICALS

1. Determination of reduced Ascorbic acid by DCPIP method
2. Determination of total Ascorbic acid by DNPH method
3. Determination of calcium in the food
4. Isolation of casein from milk and determination of its protein by any method
5. Determination of cholesterol of edible oil
6. Determination of ash content
7. Determination of moisture content of foods/food grains/ powders
8. Determination of fructose from honey/fruit pulp
9. Determination of pyridoxine of fruits/leaves
10. Isolation of lactose from skimmed milk and the estimation of lactose
11. Determination of iodine value of edible oil by titrimetry
12. Determination of acid value by titrimetry

COURSE OUTCOME

1. Analyse the role of various nutrients, their dietary allowances and relate in day-to-day life.
2. Revise the Knowledge about the water- and fat-soluble vitamins and its significance and its functions
3. Outline the Knowledge about Obesity and obtaining better results

REFERENCE BOOKS:

1. Smith EL (1983) Principles of biochemistry: mammalian biochemistry: McGraw-Hill Companies.
2. Chatterjee CC (1951) Human physiology: Medical Allied Agency.
3. Murray R, Granner D, Mayes P, Rodwell V (2003) Harper's illustrated biochemistry (LANGE basic science): McGraw-Hill Medical.
4. Guyton Aurcher C, Hall John E (2006) Text book of Medical Physiology. Elsevier India Pvt. Ltd. New Delhi.
5. Dixon M, Webb E (1979) Enzyme inhibition and activation. Enzymes 3: 126-136.
6. Rao C (1973) University General Chemistry: An Introduction to Chemical Science: MacMillan India.
7. Price NC, Frey PA (2001) Fundamentals of enzymology. Biochemistry and Molecular Biology Education 29: 34-35.
8. Palmer T, Bonner PL (2007) Enzymes: biochemistry, biotechnology, clinical chemistry: Elsevier.