

**JSS COLLEGE FOR WOMEN
(Autonomous)**

Saraswathipuram, Mysuru- 570 009



COP - FOOD AND NUTRITION SCIENCE

FOR B.Sc. DEGREE PROGRAMME

(I, II, III, IV, V & VI SEMESTER)-Revised NEP

2024-25 (Batch onwards)

FOOD AND NUTRITION SCIENCE SYLLUBUS – 2025 - 2026

FIRST SEMESTER

UNIT-I

30 HOURS

Basic concept on Food:-

Introduction, Nutrients and Nutrition, Nutritional classification of foods- (Energy yielding foods, Body building foods and protective foods), Nutrition and health. Nutritional significance of amino acids.

UNIT-II

Carbohydrates:-

Classification-(monosaccharides-glucose, fructose and galactose, disaccharides- maltose, lactose and sucrose, polysaccharides- starch, glycogen and dextrin), Sources and requirement of carbohydrates, Functions, Digestion and absorption of carbohydrates, Metabolism of carbohydrates, Regulation of blood sugar- Diabetes mellitus.

UNIT-III

Lipids:-

Classification, Sources, Refined and hydrogenated oils, Rancidity of fats, Functions of fats, Digestion and absorption of fats, Lipids in blood, Metabolism of fat, Requirement of fat, Hypercholesterolemia and coronary heart diseases.

Proteins:-

Definition, Sources, Chemical composition, Properties, Classification, Structure, Digestion and absorption of proteins, Requirement of proteins, Metabolism of proteins, Functions of proteins, Deficiency of protein and treatment. Biological importance of proteins.

Course outcomes: At the end of the course student would be able to ;

Co 1 : Understand the basic concept of food and its classification

Co 2 : Understand the importance of food chemistry

SECOND SEMESTER

UNIT-I

30 HOURS

Vitamins:-

Definition, Classification and requirement of vitamins. Absorption, Storage, Physiological function, Requirement, Deficiency-treatment and prevention of : Fat soluble and Water soluble vitamins. Chemistry and properties of vitamins.

UNIT-II

Minerals:-

Definition and classification. **Calcium:** Sources, Calcium content of blood. Function and absorption, Calcium and parathyroids, Requirement, Deficiency. **Magnesium:** Sources, Function and metabolism, Requirement, Deficiency. **Iron:** Sources, Metabolism, Absorption, Requirement, Biological importance, Deficiency and treatment. **Copper:** Sources, Requirement, Deficiency, Biological importance of copper. **Iodine:** Sources, Requirement, Deficiency, Goitre and goitrogenic substances in foods. **Zinc:** Sources, Requirement, Deficiency, Functions of zinc. **Sodium chloride:** Requirements, intake and excretion, Deficiency, Effect of excess Sodium intake.

UNIT-III

Body fluids:-

Water intake and water loss, Composition of body fluids- lymph, interstitial fluid, intracellular fluid, permeability of cell membrane, exchange of water in the body.

Course outcomes: At the end of the course student would be able to ;

Co 3 : Gain knowledge of minerals and fluids in the body

Co 4 : Food Processing, Biophysics of Food Products

THIRD SEMESTER

UNIT-I

30 HOURS

Water balance: Introduction, water intake and loss, cobalt toxicity, Fluorine- Toxic effects of excess of fluorine in human beings, prevention of toxic fluorosis, requirements.

UNIT-II

The Nutritive value of foods :

Introduction, cereals, wheat- chemical composition of wheat products, processed wheat products, chemical composition of rice, effect of milling on the vitamin contents of raw and parboiled rice.

NUTS – Peanut – Chemical composition, peanut products. Soybean - Chemical composition and processed soybean products. Coconut – Chemical composition and its products.

UNIT-III

Effect of cooking and heat processing on the nutritive value of foods

Effect of cooking on carbohydrates, Fat, Proteins, Vitamins, Minerals, Cereals (Rice and Wheat), Legumes, Vegetables and Fruits.

UNIT-IV

Recommended Dietary Allowances

Daily allowances of nutrients for – Man (Sedentary work, Moderate work, Heavy work), Women (Sedentary work, Moderate work, heavy work, pregnancy (second half of pregnancy), lactation(upto 1 year). Infants (0 to 6 months), children and Adolescents.

PRACTICALS **Semester(I & II)**

Experiments:

12 HOURS

1. Nutrient requirements and recommended dietary allowances.
2. Qualitative analysis of carbohydrates.
3. Qualitative analysis of fats/oils.
4. Determination of quality of an egg.

5. Qualitative analysis of protein.
6. Evaluation of the nutritive value of proteins.
7. pH and its determination in the food using universal indicator.
8. Effect of processing on nutritive value of foods.

Course outcomes: At the end of the course student would be able to

Co 1 : Nutrition across the Lifespan, and Global Food Systems

Co 2 : Psychology of Eating and Nutrition across the Lifespan

Fourth Semester

UNIT-I

30 HOURS

Food groups and the planning of balanced diets:

Classification of foods – Cereals and millets, pulses, Nuts and oil seeds, Vegetables, Fruits, Milk and milk products, eggs, meat, fish and other animal foods, Fats and oils, Fats and processed fat products, Sugar and other carbohydrate foods. Beverages - fruit, miscellaneous and alcoholic beverages. Planning of balanced diets.

UNIT-II

Infant nutrition and Infant foods:

Introduction, Nutritional requirements of infants, growth rate of infants, composition of human, cow, buffalo and goat's milk, modification of animal milk for infant feeding, processed infant foods, supplementary foods.

UNIT-III

Nutrition of pre- school children

Introduction, growth rate of infants and pre-school children in developing countries, deficiencies in the diets of pre –school children in developing countries, supplementary foods for pre-school children in developing countries.

UNIT-IV

Nutrition of school children and Adolescents

Introduction, growth rate of normal school children and adolescents deficiencies and balanced diet for school children and adolescents. Processed protein foods as supplements to the diets of school childrens.

Course outcomes: At the end of the course student would be able to

Co 1 : Nutrition across the Lifespan and Global Food System

PRACTICALS
Semester(III& IV)

1. Food groups: Calculation of mean energy, carbohydrates, protein, fat and fiber content of foods using ICMR tables.
2. Preparation of a table for all the food groups and identification of their contributions to Indian diet.
3. Standardization of house hold measures and hand measures-dry and liquid measures.
4. Identification and preparation of energy and protein rich recipes and method of supplementing energy/protein/Carbohydrates/fat to mean items.
5. Determination of edible portions of vegetables and fruit as purchased from the market calculate percent edible portion and nutrient content (emphasize rich sources.
6. Determination of total acidity of urine by titrimetric method.
7. Fermented foods- physical and chemical changes during fermentation with example of traditional food- idlli, dosa, dhokla and bread.

FIFTH SEMESTER

30 HOURS

UNIT - I

Diet and Nutrition in India:

Introduction, population, food consumption and needs, pattern of diets consumed in India, food availability for consumption in relation to requirements for a balanced diet – cereals, pulses, nuts and oil seeds, milk, meat, fish and eggs, oil and fats,. Deficiency diseases – vitamin A deficiency, phrynoderma, angular stomatities, beriberi, pellagra, scurvy, rickets, osteomalacia, protein- calorie malnutrition, anaemias, endemic goiter, urinary calculi, lathyrism, flourosis, Growth rate of children- preschool children and school children, .prevention of malnutrition.

UNIT - II

Prevention of malnutrition in developing countries :

Introduction, Deficiencies on diets consumed in some developing countries. Food requirements- increased production of foods, cereals, pulses, oils and fats ,sugar and jiggery, vegetables ,fruits, milk, meat, fish and egg . Production of supplementary foods – infant foods and milk substitutes, protein-enriched cereal foods, high protein foods, Supplementary feeding programme – MCH centres. The out-patient departments of hospitals, schools, crèches. Nutritional rehabilitation centers and other measures – control of population growth, Nutrition education, increased income, improvement of sanitation. Encouraging kitchen gardens and poultry farming.

Course outcomes: At the end of the course student would be able to

Co 1 : Gain knowledge on Nutrition across the Lifespan and Global Food Systems

Co 2 : Study malnutrition, effects and its prevention

SIXTH SEMESTER

UNIT – I

30 Hours

Food Analysis:-

Introduction, determination of moisture content, determination of ash, estimation of Protein- micro kjeldhal method, determination of sugar by phenol method, determination of Starch, determination of crude fibre.

Food Additives:-

Introduction, positive implications, negative aspects, uses of food additives, classification- Intentional additives and incidental additives.

UNIT – II

Colouring matters in food:-

Introduction, classification- artificial, natural and mineral colours, water soluble food colours, oil soluble colours, colour on citrus foods, method for detection of artificial colour in olive oil and beet dye in tomato products.

Preservatives:-

Chemical preservatives- sulphur-di-oxide, sulphites, sodium and potassium, sweetening agents- artificial sweetening- cyclamate and dulcin.

Course outcomes: At the end of the course student would be able to

Co 1 : Analyse food adulteration and additives

Co 2 : Develop health management, food Security and Sustainability

PRACTICALS (Semester V and VI)

12 HOURS

Experiments

1. Determination of rancidity.
2. Estimation of phosphorous.
3. Estimation of calcium.
4. Estimation of potassium by titrimetric method.

5. Determination of caffeine in tea.
6. Determination of food adulterants- ghee, coconut oil and edible oil.

Course outcomes: At the end of the course student would be able to ;

Co 1 : Qualitative analysis of food products

Co 2 : Quantitative Analysis in Health Sciences, and Research Methods.

Co 3 : Determination of food toxicity and prevention

Programme outcomes

The Expected Programme Outcomes on completion of COP- Foods and Nutrition Science course

PO1 : Provide quality education to make the students technically competent to face the challenges in the field of Food Science, Nutrition and Dietetics.

PO2 : Impart knowledge and skills necessary to work in research laboratories, food industries, health sector and at the community level.

PO3 : Synergize a new generation with professional competence to face the challenges of the food processing sector.

PO4 : Provide required knowledge and skills to work in the areas of Food Processing, Quality Control, Food Safety, and Nutritional Sciences.

PO5 : Develop entrepreneurial skills

Recommended books

1. M.Swaminathan- A text book of food and nutrition
2. Srilakshmi- A text book of food and nutrition.
3. C. Gopalan,B.V.Ramashastry and S.C. Balasubramanian- A book on nutritive value of Indian Food.