

SRR & CVR GOVERNMENT DEGREE COLLEGE (A) Vijayawada
FOOD TECHNOLOGY SYLLABUS FOR SEMESTER- I

Course I: FOOD AND NUTRITION: F&T-1

Work load: 60hrs. per semester 4hrs/week

THEORY

Objectives: This course will enable the student to:

- Understand the relationship between food, nutrition and health.
- Understand the functions of food.
- Learn about various food groups and balanced diet.
- Understand digestion, absorption and function of various nutrients and their sources.

Outcomes: At the end of the course the student will be able to

- Know the Functions of food
- Acquiring knowledge about macro and micro nutrients and their functions.
- Knowing the consequences of deficiency of taking nutrients.
- Understanding importance of non-nutrients in human nutrition
- Apply the concepts of nutrition and food and its relation to health.

CONTENTS

UNIT- I INTRODUCTION TO FOOD AND NUTRIENTS (12 lectures)

Basic terms used in study of food and nutrition, BMI and Nutritional Status, Understanding relationship between food, nutrition and health. Functions of food- Physiological, psychological and social, Concept of Balanced Diet, Food Groups, Food Pyramid.

UNIT - II MACRONUTRIENTS (12 lectures)

Classification, digestion, functions, dietary sources, RDA, clinical manifestations of deficiency and excess and factors affecting absorption of the following in the body.
Carbohydrates, lipids and proteins

UNIT - III MICRONUTRIENTS (12 lectures)

Classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of the following

- Fat soluble vitamins-A, D, E and K

- Water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin C
- Minerals – calcium, iron, iodine, fluorine, copper and zinc

UNIT-IV ENERGY

(12 lectures)

- Energy value of foods – Determination of gross energy value of foods using Bomb calorimeter and Oxy calorimeter. Physiological energy value of foods.
- Basal Metabolism – Factors affecting Basal Metabolic Rate, Measurement of BMR by Direct and Indirect Calorimetry. Formulas for calculating BMR.
- Computing Total Energy Requirement of the body based on Basal metabolic rate, Physical activity and Thermic effect of food. RDA and sources of energy.

UNIT-V WATER AND NON NUTRIENT CONTITUENTS OF FOOD

(12 lectures)

- Water – Functions, sources, requirement and regulation of water balance, Effect of deficiency and excess – Dehydration and over hydration; Electrolyte balance.
- Non nutrient constituents of foods and their importance
 - Phytochemicals – Curcumin, Lycopene, Flavonoids
 - Antioxidants – Vitamin C, E and Carotenoids
 - Detoxifying agents – Anthocyanins, Chlorophylls
 - Beneficial effects of non- nutrient constituents of food on Health.

Workload 30hrs per semester

PRACTICALS

1. Identification of Nutrient Rich Sources of foods
2. Learning to calculate Nutritive value of different foods
 - I. Cereals
 - II. Pulses
 - III. Fruits
 - IV. Vegetables
 - V. Fleshy foods (meat, poultry, egg, fish)
 - VI. Nuts and oilseeds
 - VII. Milk and milk products
 - VIII. Sugars
3. Planning, Prepare and Calculation of Macro nutrient recipes
 - Carbohydrates
 - Proteins
 - Fats
 - Fibre
4. Planning, Prepare and Calculation of Micronutrient recipes
 - Vitamins - Vitamin A, Vitamin C
 - Minerals – Calcium, Iron

Recommended Readings

1. Bamji MS, Krishnaswamy K, Brahmam, (2016) Textbook of Human Nutrition, 4th edition. Oxford and IBH Publishing Co. Pvt. Ltd.
2. Longvah, T., Ananthan, R., Bhaskarachary, K. and Venkaiah, K. (2017). Indian Food Composition Tables, Published by NIN
3. Raheena Begum, (2013). Textbook of Food, Nutrition and Dietetics, 3rd edition, Sterling Publishers Pvt. Ltd.
4. RavinderChada and PulkitMathur, (2015). Nutrition – A Life Cycle Approach, 1st edition, Orient Black Swan Private Limited
5. Shubhangini A. Joshi, (2002). Nutrition and Dietetics, 2nd edition, Tata McGraw-Hill Publishing Company Ltd.
6. Srilakshmi, B., (2018). Nutrition Science, 6th edition, New Age International Publishers.
7. Swaminadhan S, (2005). Advanced Text book on foods & nutrition, Vol. I&II (2nd revised and enlarged) Bappco.
8. VijayaKhader, (2000). Food, nutrition & health, Kalyani Publishers.

SRR & CVR GOVERNMENT DEGREE COLLEGE (A) Vijayawada
FOOD TECHNOLOGY SYLLABUS FOR SEMESTER- II

Course II: Fundamentals of Food Technology FT- 2

Work load: 60hrs. per semester 4hrs/week

THEORY

Objectives: The course will enable students to

- understand the history and evolution of food processing.
- study the structure, composition, nutritional quality and post harvest changes of various plant foods.
- study the structure and composition of various animal foods.

Outcomes: At the end of the course the student will be able to

- apply knowledge in describing the structure and composition of various foods
- understand physical and chemical changes that takes place in foods
- have knowledge on microbial spoilage of food and safe food handling practices.

CONTENTS

UNIT - 1 Introduction

(4 lectures)

Historical evolution of food processing technology.

UNIT - II Compositional, Nutritional and Technological aspects of Plant foods I.

Cereals and Millets

(10 lectures)

Structure and composition of cereal, Parboiling of rice- advantages and disadvantages.

Malting, gelatinization of starch, types of browning- Maillard & caramelization.

Pulses

(6 lectures)

Structure and composition of pulses, toxic constituents in pulses, processing of pulses soaking, germination, decortications, cooking and fermentation.

Fats and Oils

(6 lectures)

Classification of lipids, types of fatty acids - saturated fatty acids, unsaturated fatty acids. essential fatty acids, trans fatty acids. Refining of oils. types- steam refining. alkali refining. bleaching, steam deodorization, hydrogenation. Rancidity -Types- hydrolytic and oxidative rancidity and its prevention.

UNIT - III Compositional, Nutritional and Technological aspects of Plant foods II.

Fruits and Vegetables

(8 lectures)

Classification of fruits and vegetables, general composition, enzymatic browning, names and sources of pigments, Dietary fibre. Post harvest changes in fruits and vegetables – Climacteric rise, horticultural maturity, physiological maturity, physiological changes, physical changes, chemical changes, pathological changes during the storage of fruits and vegetables.

UNIT - IV Compositional, Nutritional and Technological aspects of Animal foods

Flesh Foods - Meat, Fish, Poultry

(12 lectures)

Meat - Definition of carcass, concept of red meat and white meat, composition of meat, marbling, post-mortem changes in meat- rigor mortis, tenderization of meat, ageing of meat.

Fish - Classification of fish (fresh water and marine), aquaculture, composition of fish, characteristics of fresh fish, spoilage of fish- microbiological, physiological, biochemical.

Poultry - Structure of hen's egg, composition and nutritive value, egg proteins, characteristics of fresh egg, deterioration of egg quality, difference between broiler and layers.

Milk and Milk Products

(6 lectures)

Definition of milk, chemical composition of milk, its constituents, processing of milk, pasteurization, homogenization. An overview of types of market milk and milk products.

Unit - V Food Microbiology

(8 lectures)

- Food Spoilage – Microorganisms causing spoilage – Factors responsible for spoilage and changes brought about in food by microorganisms
- Microorganisms that bring about useful changes in food.
- Microbiology of different foods – Contamination and spoilage of milk, egg, meat, fish, vegetables and fruits
- Food Sanitation and Hygiene – Safe food practices during preparation, storage and serving of food.

PRACTICALS

1. Study different types of browning reactions: enzymatic and non enzymatic.
2. To study gelatinization behaviour of various starches
3. To study the concept of gluten formation of various flours.
4. To study malting and germination.
5. To study dextrinization in foods.
6. Identification of pigments in fruits and vegetables and influence of pH on them.

Recommended Readings

1. Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013
2. Roday,S. Food Science, Oxford publication, 2011.
3. B. Srilakshmi, Food science, New Age Publishers,2002
4. Meyer, Food Chemistry, New Age,2004
5. De Sukumar., Outlines of Dairy Technology. Oxford University Press, 2007