

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA - 10.

(An Autonomous college in the jurisdiction of Krishna University, Machilipatnam, A.P)

SRI DURGA MALLESWARA SIDDHARTHA MAHILA KALASALA, VIJAYAWADA- 10

(An Autonomous college in the jurisdiction of Krishna University: Machilipatnam)

<i>FOOD SCIENCE & TECHNOLOGY</i>	<i>FST - T11A</i>	2020-21	B.Sc. FMC&FMB
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SEMESTER- I

Course – I

Hours: 60Hr, 4hrs/ week

Credits: 4

FUNDAMENTALS OF FOOD TECHNOLOGY

Unit-I

1. Introduction to Food Science

Hours: 12

- 1.1 **Foods** – Definition and objectives in the study of foods-functions of foods, Classification of food by function and relation to nutrition (2hr)
- 1.2 **Cooking – Objectives** of cooking, Advantages and disadvantages of each method.(2hr)
- 1.3 **Preliminary preparations** (1hr)
- 1.4 **Methods of cooking:**
 - Moist heat methods (2hr)
 - Dry heat methods (2hr)
 - Combination methods (1hr)
- 1.5 Effect of cooking on different nutrients. (2hr)

Unit-II

2. Plant Foods – I

Hours: 12

- 2.1 **Cereals and Millets** – Structure, Composition and Nutritive Value, Selection, storage and use in cookery malting, Gelatinization of Starch (4hr)
- 2.2 **Pulses and Legumes** – Composition and Nutritive Value, Selection, Storage, Toxic Content in pulses and use in cookery (4hr)
- 2.3 **Nuts and oil seeds** – Nutritive value, types and functions of oils and fats, use in cookery (3hr)

Unit-III

3. Plant Foods – II

Hours: 12

- 3.1 **Vegetables**– Classification, Selection, Nutritional aspects, Pigments, Enzymatic and non-enzymatic browning. (5hr)
- 3.2 **Fruits** - Classification, Selection, Grading and storage, Nutritional aspects, Pigments (5hr)
- 3.3 **Spices and condiments** – Nutritive value, Function, use in cookery (2hr)

Unit-IV

4. Animal Foods

Hours: 12

- 1.1 **Milk and milk Products** - Nutritive Value, use in cookery (4hr)
- 1.2 **Egg** - Structure, Nutritive Value, Methods to Assess Quality of eggs, changes during storage and use in cookery (4hr)
- 4.3 **Meat, Poultry, Fish** – Nutritive value, use in cookery (4hr)

Unit-V

5. Food Sanitation and Contamination

Hours: 12

- 5.1 **Food Sanitation** – Safe food practices during preparation, storage and serving of food, Personal

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Hygiene of Food Handler (5hr)

5.2 Food Contamination and ill effects – Causes of food contamination, types of contamination (Heavy metals, Pesticide residues, environment pollutants, natural toxins), food borne illness and treatment. (7hr)

CO-CURRICULAR ACTIVITIES ASSESSMENT METHODS

1. Student Seminars on different food groups
2. Collection of samples of different food products available in the market and study their nutrient composition and use in cookery.
3. Field visit – Visit to food processing units.
4. Field study – Educating public on detection of common food adulterants at house hold level
5. Celebration of Important Days (National and International)
 - World Nutrition day-May 28th
 - Nutrition week (Sep 1st 7th)
 - World food day - October 16th.
6. Continuous Evaluation: Monitoring the progress of student's learning
7. Class tests, Worksheets and quizzes
8. Presentations, Projects, assignments and group discussions
9. Semester end examinations: critical indicators of student's learning and teaching
Methods adopted by teachers throughout the semester

REFERENCES

1. Bamji MS, Krishnaswamy K, Brahmam GNV. (2016). Textbook of Human Nutrition, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Manay N. Shakuntala & Shadakshara Swamy.(2008). Foods, Facts and Principles, 3rd edition, New Age International Publishers. .
3. Reddy,S.M.(2015). Basic Food Science & Technology, 1st edition, New Age International Publishers.
4. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra, S. (2010). Basic Food Preparation: A Complete Manual, Fourth Edition, Orient Black Swan Ltd.
5. Srilakshmi, B.(2018). Food Science, 7th edition, New Age International Publishers.
6. Wardlaw MG, Insel PM. (2004). Perspectives in Nutrition, Sixth Edition, Mosby Publisher.

TEXT BOOKS

1. Sumati R. Mudambi, M.V. Rajagopal. (2006). Food Science, 2nd edition, New Age International Publishers.
2. G.Subba Lakhmi, Sobha A.Udipi(2001), New Age International 1st edition.

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An autonomous college in the jurisdiction of Krishna University: Machilipatnam

FOOD SCIENCE & TECHNOLOGY

FST - P11A

2020-21

B.Sc. FMC&FMB

SEMESTER- I

Practical I

Credits: 1

Hours: 30hrs, 2hr/week

FUNDAMENTALS OF FOOD TECHNOLOGY

Course outcomes

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

- Standardise weights and measures of various food items.
- Analyse different processing techniques to improve nutritive quality of foods by germination, fermentation, supplementation, fortification etc.
- Plan and prepare nutritious recipes by using different foods

PRACTICALS

1. Standardization of weights and measures of various food items.
2. Estimation of Gluten content in given flours
3. Preparation of Nutritious snacks using various methods of cooking.
4. Preparation of products using sprouts.
5. Preparation of and evaluation of pectin from given fruits
6. Observe the enzymatic reaction for given fruits and vegetables and its prevention methods
7. To learn the preparation and importance of Bulls eye and Poached egg, Green ring formation
8. To know the smoking point of different oils.
9. Educating public on hygiene practices.

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FOOD SCIENCE & TECHNOLOGY	FST - T21A	2020-21	B.Sc. FMC&FMB
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SEMESTER- II

Course – II

Hours: 60Hr, 4hrs/ week

No. of. Credits: 4

FOOD AND NUTRITION

COURSE OUTCOMES

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

- 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.
- Students can apply the knowledge of nutrition for disease prevention in the real time

LEARNING OBJECTIVES:

1. The main objective of the course is to explain the classification of various nutrients
2. Deals with functions of specific nutrient in maintaining good health.
3. It also deals with the selection of foods based on their nutrient composition.
4. Identifying the signs and symptoms of different nutrient disorders
5. Understand the concept of nutrition and food in relation to health.

UNIT-I

1. Introduction to Nutrition and Macro Nutrients

Hours: 15

- 1.1 Introduction and scope of Nutrition, ICMR Basic Five Food Groups, Food Pyramid, Relationship between Food, Nutrition, Health and Disease, BMI, Nutritional status, Concepts of meal planning(3hr)
- 1.2 Macro Nutrients
 - 1.2.1 Carbohydrates - Classification, functions, digestion, absorption, Dietary sources, RDA, clinical manifestations of deficiency and excess and storage (4hr)
 - 1.2.2 Lipids - Classification, functions, digestion, absorption, dietary sources, RDA, clinical manifestations of deficiency and excess and storage (4hr)
 - 1.2.3 Proteins - Classification, functions, digestion, absorption, dietary sources, RDA, clinical manifestations of deficiency and excess (4hr)

UNIT – II

2. Micro Nutrients – 1

Hours: 12

- 2.1 Vitamins – Classification
 - 2.1.1 Fat soluble vitamins A, D, E, K functions, dietary sources, RDA, clinical manifestations of Deficiency and excess (6hrs)
 - 2.1.2 Water soluble vitamins – B Complex Vitamins - Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Cyanocobalamin, Vitamin C. (6hrs)

UNIT - III

3. Micro Nutrients – 2

Hours:12

- 3.1 Minerals – classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of Calcium and Phosphorus (4hr)

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3.2 Classification, functions, dietary sources, RDA, clinical manifestations of deficiency and excess of Sodium, Potassium and Magnesium (4hr)

3.3 Micro minerals or Trace elements – Iron, Iodine, Fluorine and Zinc (4hr)

UNIT - IV

4. Energy

Hours:09

4.1 Energy value of foods – Determination of gross energy value of foods using Bomb calorimeter and Oxy calorimeter. Physiological energy value of foods. (3hr)

4.2 Basal Metabolism – Factors affecting Basal Metabolic Rate, Measurement of BMR by Direct and Indirect Calorimetry. Formulas for calculating BMR. (3hr)

4.3 Computing Total Energy Requirement of the body based on Basal metabolic rate, Physical activity and Thermic effect of food. RDA and sources of energy. (3hr)

UNIT – V

5. Water and Non Nutrient constituents of Food

Hours:12

5.1 Water – Functions, sources, requirement and regulation of water balance (3hr)

5.2 Effect of deficiency and excess – Dehydration and over hydration; Electrolyte balance. (3hr)

5.3 Non nutrient constituents of foods and their importance (6hr)

5.3.1 Phytochemicals – Curcumin, Lycopene, Flavonoids

5.3.2 Antioxidants – Vitamin C, E and Carotenoids

5.3.3 Detoxifying agents – Anthocyanins, Chlorophylls

5.3.4 Beneficial effects of non- nutrient constituents of food on Health.

CO-CURRICULAR ACTIVITIES ASSESSMENT METHODS

1. Student seminars on different nutrients.
2. Preparation of posters, charts, flashcards etc. related to different nutrients – Functions, RDA dietary sources, nutrient content of foods and deficiency symptoms.
3. Collections of food samples rich in particular vitamins and minerals like calcium, iron etc.
4. Visit to food stores, vegetable and fruit markets to study locally available foods.
5. Study projects to collect the data from people. Eg. Foods avoided or given in specific conditions.
6. Celebration of Important Days (National and International)
 - World's Breast-Feeding Week (August 1st - 7th)
 - Nutrition Week – September 1st - 7th
 - Nutrition Month – September month
 - Hand Washing Day – October 15th
 - World Food Day – October 16th
7. Continuous Evaluation: Monitoring the progress of student's learning
8. Class tests, Worksheets and quizzes
9. Presentations, Projects, assignments and group discussions
10. Semester end examinations: critical indicators of student's learning and teaching methods adopted by teachers throughout the semester

REFERENCES

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

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3. Raheena Begum, (2013). Textbook of Food, Nutrition and Dietetics, 3rd edition, Sterling Publishers Pvt. Ltd.
4. Ravinder Chada and Pulkit Mathur, (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. Swaminadhan S, (2005). Advanced Text book on foods & nutrition, Vol. I&II (2nd revised and enlarged) Bappco.
7. Vijaya Khader, (2000). Food, nutrition & health, Kalyani Publishers.

TEXT BOOKS

1. Srilakshmi, B., (2018). Nutrition Science, 6th edition, New Age International Publishers.
2. Dr. Shashi Goyal, Pooja Gupta (2012), New Age International Publishers 1st edition

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*FOOD SCIENCE &
TECHNOLOGY*

FST - P21A

2020-21

B.Sc. FMC&FMB

SEMESTER- II

PRACTICAL COURSE - II

Hours: 30hrs, 2hr/week

Credits: 1

FOOD AND NUTRITION

Practical's

1. Identification of Nutrient Rich Sources of foods, their seasonal availability
2. Learning to calculate Nutritive value of different foods
 - I. Cereals
 - II. Pulses
 - III. Fruits
 - IV. Vegetables
 - V. Fleishy 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

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FOOD SCIENCE & TECHNOLOGY	FST - T31A	2021-22	B.Sc. FMC&FMB
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SEMESTER- III

Hours: 60Hr, 4hrs/ week

Course – III

No of. Credits: 4

TECHNOLOGY OF PLANT FOODS

COURSE OUTCOMES

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

- Understand current trends in the field of food technology
- Learn about machinery involved in processing of various food stuffs
- Comprehend various changes that occur during food processing and storage
- Understands several applications concern with food processing from raw material stage to the end product stage
- With the help of new and novel technologies the students would be able to develop new and better products.

COURSE OBJECTIVES

- The main objective of the course is to explain the processing of various plant foods
- To understand types of equipment's involved in processing from raw material to end product.
- To gain knowledge on processing of by-products that get separated after basic processing
- Understand the physical, chemical and biological changes that occur in foods during processing
- To gain knowledge on overcoming the hazards and bringing out the product with better quality

UNIT – I

Hours:09

1. Introduction to Food Science and Technology

1. Scope and Current Trends in Food Science and Technology:

- Nutraceuticals
- Genetically Modified Foods
- Convenience foods
- Space Foods
- Food Fortification
- Organic foods

UNIT – II

Hours: 15

1. Cereals, Cereal Products and Millets:

- **Rice Processing:** Milling – commercial milling, modern milling, CFTRI processing. Ageing of rice, parboiling, Processing of by-products – Flaked rice, Noodles, Puffed Rice, Popped Rice
- **Wheat:** Milling, Flour treatment, flour grade, Processing of by-products – Shredded products, Granular products, Gold Fingers, Vermicelli.
- Processing of Maize.

2. Pulses and Legumes:

- Processing of commonly used legumes- Soaking, Germination, Decortication, Fermentation.
- Milling of pulses
 - Soya bean
 - Red gram
 - Pigeon pea

UNIT – III

Hours: 12

Fruits and

Vegetables Processing

- Physico Chemical properties, textural components
- Reasons of spoilage & Pathological changes during the storage of fruits and vegetables
- Effect of processing on pigments, Dietary Fiber.
- Important Properties of Enzymes in fruits and vegetable Technology.

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UNIT – IV

Hours: 15

1. Fats and Oils

- Processing of nuts and oilseeds
- Mechanical pressing
- Screw pressing,
- Prepress solvent extraction direct solvent extraction and refining
- Changes in fat during Heating, Rancidity.

2. Sugar

- Properties of sugar,
- Types and stages of sugars
- Manufacturing of sugar.

UNIT – V

Hours: 09

1. Food packaging

- Functions
- Classification of packaging
- Materials used for packaging
- Recent developments in packaging
- Packaging of specific foods (cereals, pulses, fruits and vegetables, fleshy foods)

CO-CURRICULAR ACTIVITIES ASSESSMENT METHODS

- Student Seminars on different Plant foods
- Class tests, Worksheets and Multiple-choice questions.
- Presentations, Projects, assignments and group discussions
- Invited lectures and demonstration by local experts.
- Exhibition on Millet varieties, Plant protein rich foods & recipes.
- Preparation of posters, charts, flashcards etc.
- Hands on training on handling and packaging methods of Fresh fruits and vegetables
- Watching Videos on plant food processing methods
- Visits to sugar processing unit, cereals processing unit, Oil seed processing unit.
- Semester end examinations: critical indicators of student's learning and teaching Methods adopted by teachers throughout the semester

REFERENCES:

1. Bamji MS, Krishna swamy K, Brahmam GNV (2009). Text book of Human Nutrition, 3rd edition. Oxford and IBH publishing Co. Pvt. Ltd.
2. Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013

TEXT BOOK:

1. Vijaya Khader, Food, Nutrition & Health, Kalyan Publishers, 2000.
2. SM Reddy (2015) Basic Food Science & Technology, New Age International publishing 1st edition.

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FST - P31A

2021-22

B.Sc. FMC&FMB

SEMESTER- III

PRACTICAL COURSE - III

Hours: 30hrs, 2hr/week

Credits: 1

TECHNOLOGY OF PLANT FOODS

Practical's

1. To study the Microscopic structure of raw and gelatinized starch.
2. Dextrinization in foods
3. Effect of heat, acid and alkali on various pulses.
4. Effect of heat, acid and alkali on various plant pigments
5. Sugar cookery: To Demonstrate the stages of sugar cookery.
6. To demonstrate the method of preparing peanut butter.
7. Testing of packaging material.

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FOOD SCIENCE & TECHNOLOGY

FST - T41A

2021-22

B.Sc. FMC&FMB

SEMESTER- IV

COURSE -IV

Credits: 4

TECHNOLOGY OF ANIMAL FOODS

Hours: 60Hr, 4hrs/ week

UNIT - I

1. Milk and Milk Products

Hours :9

- Processing – Clarification, Pasteurization, Homogenization, Fortification, Sterilization. Types of market milk and milk products.
- Processing of milk products- butter, ghee, cheese, paneer, khoa, ice cream

UNIT - II

1. EGGS

Hours:9

- Processing of egg, Effect of heat on Egg proteins.
- Preservation of shell egg
- Types of egg products

UNIT - III

1. MEAT

Hours: 12

- Meat quality
- Slaughter
- Post mortem changes
- Aging and curing
- Processing of meat – canned meat, cured meat, smoked meat, sausages, dehydration meat, strained baby foods on meat

UNIT - IV

Hours: 15

1. POULTRY

- Processing of poultry
- Preservation of poultry

2. SEA FOODS

- Processing – canning, fish meal, fish protein concentration, solvent extraction, powdering and packing, fish liver oil.
- Preservation
- Other sea foods; prawns, crabs

UNIT - V

Hours: 15

1. Fermented foods:

- Introduction, Types of Fermented foods, Traditional Fermented foods, Concept of Probiotics.

2. Beverages

- Coffee: composition, processing of coffee seeds.
- Tea – composition and processing of tea
- Coco, chocolate: nutritive value, processing of coco
- Types of beverages: alcoholic and non-alcoholic.

CO-CURRICULAR ACTIVITIES ASSESSMENT METHODS

- Student Seminars on different Animal foods
- Class tests, Worksheets and Multiple-choice questions.

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- Presentations, Projects, assignments and group discussions
- Invited lectures and demonstration by local experts.
- Exhibition on probiotic foods, Caffeinated products, and processed foods.
- Preparation of posters, charts, flashcards etc.
- Hands on training on beverages.
- Watching Videos on animal food processing methods
- Visit to milk processing units, Coffee processing units.
- Semester end examinations: critical indicators of student's learning and teaching Methods adopted by teachers throughout the semester

References

1. Meyer, Food Chemistry, New Age international publications 2004
2. Potter N, Hotchkiss JH. Food Science. 5th edition. Delhi: CBS Publishers, 2007.
3. Sethi P and Lakra P. Ahaar Vigyan, Poshan evam Suraksha. Elite Publishing House 2015.
4. Vaclavik Vickie A and Christian Elizabeth W. Essentials of Food Science. 2nd Edition. New York: Academy Publishers, 2008

TEXT BOOKS

1. De Sukumar., Outlines of Dairy Technology, Oxford University Press, 2007
2. Ravinder A, Srinivas Maloo (2013) Fermented Foods & Beverages Technology , Himalaya Publishing House

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SEMESTER- IV

PRACTICAL- IV

Credits: 1

Hours: 30hrs, 2hr/week

TECHNOLOGY OF ANIMAL FOODS

Course Outcomes

At the end of the course the students will be able to

- Know the factors that effect milk protein, quality of egg as well as tenderness of meat
- Know the preparation of fermented milk products
- Have knowledge on making of beverages and chocolates

PRACTICALS

1. Effect of heat, acid and alkali on the protein milk
2. Evaluation of eggs for quality parameters (market egg/ branded eggs)
3. To know the Different factors affecting tenderness of meat.
4. To learn the making of chocolates
5. Cut out examination of canned fish
6. To learn the preparation of fermented milk products
7. Preparation of cereal – pulse fermented products.

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SEMESTER- IV

Hours: 60Hr, 4hrs/ week

Course – V

Credits: 4

ADVANCED TECHNOLOGY OF FOOD PRESERVATION & QUALITY TESTING

UNIT I

Hours: 12

Food Preservation

1. Principles and Methods of food preservation –Introduction
2. Methods of Preservation:
 - High temperature: Factors contributing to response to heat, thermal death time, Commercial heat preservation method – Canning.
 - Low temperature: Refrigeration, factors influencing refrigerated storage, freezing/ frozen storage, methods of freezing
 - Drying: Advantages of Drying, Drying Techniques & methods – Solar drying, air convection drying, Kiln dryer, cabinet dryer, roller dryers, spray dryer, vacuum dryers, freeze dryers, foam drying.
 - Irradiation: Types of Irradiation, Mechanism of irradiation.
 - Newer methods of preservation

UNIT II

Hours: 15

Advanced Fruit and vegetables processing – I

1. **Jam, Jelly and Marmalade: Role of Pectin and Theory of gel formation**
 - a. **Jam:** Constituents, selection of fruits, processing and Technology, Problem in Jam Production.
 - b. **Jelly:** Essential Constituents, Processing and technology, Defects in Jelly making.
 - c. **Marmalade:** Processing and technology, defects
2. **Preserve** – Processing and technology of Amla murabba.
3. **Pickles** – Classification, Method of preservation, Steps of preparation of pickles, Causes of spoilage in pickling, problems in pickle making.

UNIT III

Hours: 12

Advanced Fruit and vegetable processing –II

3. **Tomato Processing:** Selection, pulping and processing of tomato juice, tomato puree, Ketch up, soup.
4. **Fruit Beverages** –Classification, Preservation of fruit juices (with special emphasis on pasteurization, use of chemical preservatives, sugar), role of various ingredients. Processing of Squashes, cordials, nectars, concentrates and powder.

UNIT IV

Food Quality Management

Hours: 12

1. Food Additives

- Introduction, Need of food Additives in Food Processing and Preservation, Characteristics and Classification of Food Additives.
- Antimicrobial agents, Chemical preservatives.
- Antioxidants: Introduction, Mechanism of action, Natural and Synthetic antioxidants, Technological aspects of antioxidants.
- Sweeteners: Introduction, Importance, Classification – Natural and Artificial

2. Food Laws & Regulations: Codex & Hazard Analysis Critical Control Point

UNIT V

Evaluation Methods of Food Quality Testing

Hours: 09

- Sensory Evaluation: Sensory Attributes, Sensory Test: Difference Test, Rating Test, Sensitivity test, Descriptive test.
- Objective Evaluation: Types and Testing: Physical, Chemical, Microscopic testing.

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CO-CURRICULAR ACTIVITIES ASSESSMENT METHODS

- Student Seminars on different local available preserved foods
- Class tests, Worksheets, Multiple-choice questions & model exam
- Presentations, Projects, assignments and group discussions
- Invited lectures and demonstration by local experts.
- Exhibition on probiotic foods, Caffeinated products, and processed foods.
- Exhibition of various types of locally available fruits and vegetables.
- Hands on training on making fruit juices.
- Hands on training on making of potato, yam, onion, Plantain chips.
- Watching videos on preservation of fruits and vegetables.
- Visit to Food Industry
- Semester end examinations: critical indicators of student's learning and teaching Methods adopted by teachers throughout the semester

REFERENCE:

1. B. Srilakshmi, Food Science, 7th edition, New Age International Publishers Ltd., 2015
2. S M Reddy, Basic Food Science and Technology, New Age International Publishers Ltd., 2017
3. Pieter A, Luning, Willem J. marcelis, Food Quality Management Technological and Managerial principles and practices, Wageningen, 2009.
4. Brannen and et al., Food Additives, Marcel Dekker, New York, 1990.
5. Food processing, M.K.Singh, Discovery Publishing House, New Delhi, 2007
6. Food preservation and processing, Manoranjan Kalia & Sangita sood, kalyani Publishers., 2008

Text Books

1. Preservation of fruit and vegetables, Vijaya Khader, kalyani Publishers, 1999.
2. T.N Morris (2004) Principles of Food Preservation , Agrobios (INDIA)

1. Food preservation and processing, Manoranjan Kalia & Sangita sood, kalyani Publishers., 2008

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<i>FOOD SCIENCE & TECHNOLOGY</i>	<i>FST - T01</i>	2020-21	B.Sc. FMC&FMB
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PRACTICAL COURSE – V

SEMESTER- IV

Credits: 1

Hours: 30hrs, 2hr/week

ADVANCED TECHNOLOGY OF FOOD PRESERVATION & QUALITY TESTING

Course outcomes

At the end of the course the students will be able to

- Prepare pectin products, fruit beverages as well as various preserved foods
- Prepare recipes using food additives
- Do different sensory tests for different foods

Practical's

1. Cut out analysis of canned food.
2. Drying of Fruits and Vegetables.
3. Preparation of pectin products
 - a. Jam (Mixed fruit jam/ Apple jam)
 - b. Jelly (Guava/ Grape)
 - c. Marmalades(Orange)
 - d. Amla preserve
4. Preparation of Salt concentration - Pickles (Mixed Vegetables/ Carrot Pickles)
5. Preparation of Tomato ketchup
6. Preparation of Fruit Beverage
 - a. Orange Squash
 - b. Grape Squash
 - c. Pineapple Squash
 - d. Lemon Squash
 - e. Lemon Ginger Cocktail
7. Recipes using Food Additives.
8. Preparation and evaluation of Cookies, Pastry, Cake Icing
9. Sensory Evaluation Tests for different foods

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SEMESTER – V

PRACTICAL – V

CREDITS: 3

FOOD PRESERVATION TECHNOLOGY 45Hrs

1. Preparation of pectin products
 - a. Jam
 - b. Jelly
 - c. Marmalades
 - d. Amla preserve
2. Preparation of Salt concentration - Pickles
3. Preparation of Tomato ketchup
4. Preparation of Fruit Beverage
 - a. Orange Squash
 - b. Grape Squash
 - c. Pineapple Squash
 - d. Lemon Squash
 - e. Lemon Ginger Cocktail
5. Visit to Food Processing Unit.

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SEMESTER – V

PAPER – VI

CREDITS: 3 FOOD SAFETY, FOOD QUALITY

AND SENSORY EVALUATION

UNIT I

1. Food Safety and Standards Act 10 Hrs

- General Principles and Objectives of Food Safety.
- Introduction to Food Acts Laws and Standards
- National food Safety and National Standard acts(FPO, MPO, BSI, AGMARK, FDA)
- International Standards(ISO, CODEX, Alimentarius)
- Regulatory agencies in India (CCFC,CFL)
- Consumer protection act.

UNIT II

8 Hrs

2. Food Quality Management

- Food Quality control
- Characteristics of quality
- Quality Assurance
- Total Quality Management
- Quality management system
- Good Manufacturing Practices.
- Hazards Analysis Critical Control Point system(HACCP)

UNIT III

9 Hrs

3. Contamination of Foods

- Intentional Adulteration
- Incidental Adulteration
- Methods of Detection
- Contamination of Food with Harmful Micro organisms
- Food Borne Diseases
- Metallic contamination
- Contamination formed during processing and packaging.

UNIT IV

10 Hrs

4. Food Additives

- Introduction, Need of food Additives in Food Processing and Preservation
- Characteristics and Classification of Food Additives.
- Antimicrobial agents; Nitrites, Sulphides, Sulphur di oxides, Sodium chloride, Hydrogen peroxide.
- Antioxidants: Introduction, Mechanism of action, Natural and Synthetic antioxidants, Technological aspects of antioxidants.
- Sweeteners: Introduction, Importance, Classification – Natural and Artificial
- Chemical, Technological and Toxicological aspects.

UNIT V

5. Sensory Evaluation of Food 8 Hrs

- Sensory Characteristics of Food: Appearance, Colour, Flavour.
- Sensory Test: Reasons for Testing Food Quality, Trained Panel Members, Testing Laboratory.
- Sensory Food Evaluation Techniques: Differential test, Rating test, Descriptive test, Sensitivity threshold test.

Reference:

1. B. Srilakshmi, Food Science, 6th edition, New Age International Publishers Ltd.,2015
2. S M Reddy, Basic Food Science and Technology, New Age International Publishers Ltd., 2017
3. Pietermel A, Luning, Willem J. marcelis, Food Quality Management Technological and Managerial principles and practices, Wageningen, 2009.
4. Brannen and et al., Food Additives, Marcel Dekker, New York, 1990.
5. IFST. Food Hygiene Training: A Guide to its Responsible management, UK: Institute of food science and technology 1992.
6. Manay NS and Shadakshaswamy M. Food facts and principles, New age international, 2004

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SEMESTER – V

PRACTICAL – VI

CREDITS: 3

FOOD SAFETY, FOOD QUALITY AND SENSORY EVALUATION

45Hrs

Presentation on Food Safety Practices in any local food outlet.

1. Quality inspection of various food stuffs – Cereals, Pulses, Spices and condiments etc.
2. Preparation of cakes and quality control
3. Preparation and evaluation of cookies, pastry, cake icing.
4. Sensory evaluation tests for different foods
5. Recipes using Food Additives.
6. Detection of common Adulterants
7. Visit to Food Industry Quality control lab

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SEMESTER – VI

PAPER – VII

CREDITS: 3

Elective A1

FAMILY NUTRITION

UNIT I

8 Hrs

- a. Introduction to Meal Planning:** Balanced diet
- b. Principles of Meal Planning:** Objectives, Steps in Meal Planning, Dietary Guidelines for Indians, Food Exchange Lists.
- c. Nutrition during Pregnancy:** Physiological changes, Stages of Pregnancy, Hormonal control, Nutritional Requirement, General problems and complications.

UNIT II

10 Hrs

- d. Nutrition during Lactation:** Physiology of Lactation, Nutritional Requirements, Deficiency disorders, Feeding the baby.
- e. Nutrition during Infancy:** Growth and Development, Nutritional Requirements, Breast Feeding, Infant Food Formula, Weaning- Introduction of Supplementary foods, Feeding pattern.
- f. Nutrition during Pre-School:** Physiological Development & Food Intake, Nutritional Requirements, Nutrition related problems, Development of Food Habits.

UNIT III

10 Hrs

- g. Nutrition during School age:** Growth, Nutritional Requirements, Importance's of Snacks, School lunch programmes.
- h. Nutrition during Adolescence:** Growth and Nutrition needs, Food Choice, Eating disorders, Factors influencing Food Intake, Tradition foods and regional dietary patterns.
- i. Nutrition during Adulthood:** Reference Man, Reference Women, Nutrition needs and Requirements during various Physical Activities (Sedentary, Moderate, Heavy work), Diet and Lifestyle related diseases and their prevention.

UNIT IV

7 Hrs

- j. Geriatric Nutrition:** Factors Affecting Food Intake and Nutrient use, Nutrition Requirements, Nutrition related Problems, Physiological Changes in Elderly, Nutritional and Health concerns in oldage and their management.

UNIT V

10 Hrs

- k. Methods of Assessment of Nutritional Status:** Diet Survey, Anthropometry Assessment, Clinical Assessment, Bio-chemical Assessments.
- l. Malnutrition Eradication Programmes:** ICDS, Vitamin A & Iron Prophylaxis programme, Iodine deficiency disorders control programme.
- m. National and International Programmes:** FAO, WHO, UNICEF, CARE, ICMR-NIN, CFTRI.

Reference:

1. B.Srilakshmi, Dietetics, 7th edition, New Age International (P) Ltd., 2014.
2. F.P.Antia, Clinical Nutrition and Dietetics, Oxford University Press, 2003
3. Swaminadhan, M., 2007, Essential of Food and Nutrition Volume I& II, The Bangalore Printing and publishing Co. Ltd., Bangalore.
4. Guthrie Helen A. & Mary Frances Picciano, 1999, Human Nutrition, WCB Mc. GrawHill, Baston.
5. Proudfit – Robinson, Oxford & IBH Publishing Co, 1971, Normal and Therapeutic Nutrition

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SEMESTER – VI

PRACTICAL – VII

CREDITS: 3

FAMILY NUTRITION

45Hrs

1. Planning and Preparation of a Balanced Diet for a Pregnant Women.
2. Planning and Preparation of a Balanced Diet for a Nursing Mother.
3. Planning and Preparation of a Balanced Diet for a Pre-School child.
4. Planning and Preparation of a Balanced Diet for a School aged child.
5. Planning and Preparation of a Balanced Diet for a Adolescent.
6. Planning and Preparation of a Balanced Diet for a Adult Man & Women (Sedentary, Moderate & Heavy).
7. Planning and Preparation of a Balanced Diet for a Elderly .
8. Record diet of self using 24 hour dietary recall and its Nutritional analysis.
9. Planning of Nutritious Snacks for different age and income groups.

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SEMESTER – VI

PAPER – VIII

CREDITS: 3

Elective A2

DIET THERAPY UNIT I

9 Hrs

a. **Therapeutic Nutrition:** Purpose and Principles and Classification of Therapeutic diets, Modifications of Normal diet – Liquid diet, Semi solid diet, etc. Methods of Feeding Patients: Tube feeding, Intravenous feeding, Pre and Postoperative diet.

b. **Role of Dietician:** Responsibilities of Dieticians, Interpersonal relationship other patient, Planning and Implementing Dietary care, Their Approach to Nutritional care.

UNIT II

9 Hrs

c. **Diet in Fevers:** Metabolic changes, Dietary guidelines for Typhoid, Tuberculosis.

d. **Diet in Energy Imbalance:** Obesity and Leanness- causes, complications and health effects, dietary treatment and other recommendations.

UNIT III

9 Hrs

e. **Diet in Gastro Intestinal Diseases:** Gastritis, Peptic ulcer – Etiology, symptoms, clinical findings, treatment, dietary principles and modifications.

f. **Diet in Intestinal diseases:** Diarrhea (child and adult), classification, modification of diet. Constipation, dietary considerations

UNIT IV

9 Hrs

g. **Diet in liver diseases:** Etiology, symptoms, dietary treatment in Hepatitis, Cirrhosis of liver, Hepatic coma.

h. **Diet in Cardio-Vascular diseases:** Etiology, Causes, symptoms, Dietary Modification, Role of fat in Atherosclerosis. Hypertension – Dietary Modifications.

UNIT V

9 Hrs

i. **Diet in Renal Disease:** Causes, , Dietary Treatment in Glomerulonephritis, Acute and Chronic Renal failure, Urinary calculi – causes, dietary treatment.

j. **Diet in Diabetes Mellitus:** Classification, Causes, Tests for detection (Diagnosis), Metabolic changes, Dietary Treatment(GI Foods, Foods Exchange), Meal management, and diabetic complications.

References:

- i. Antia, F.P., Clinical dietetics and nutrition, 3rd edition Oxford University press, Bombay, 1989.
- ii. Passmore, P. and Eastwood, M.A., Human Nutrition and Dietetics, 8th edition, ELBS, Churchill, Livingstone, 1986.
- iii. Swaminathan, M., Dietetics, The Bangalore Printing & Publishing Co. Ltd., Bangalore, 1980
- iv. Sri Lakshmi, B., 2005, Dietetics, New Age International (P) Ltd., Publishers, New Delhi.
- v. Robinson, C.H. and Winley, E.S., Basic Nutrition And Diet Therapy, 5th ed, Macmillan Pub, Co., N.Y., 1984.
- vi. Swaminadhan, M, 1988, Essential of food and nutrition, volume I & II, The Bangalore printing and publishing Co. Ltd., Bangalore.
- vii. Bamji, Mehtab S, et al., (ed), 2002, textbook of human nutrition, Oxford and IBM publishing, Co., Pvt., Ltd., New Delhi.
- viii. Jgader Vuhatam 2001., Foods – Nutrition and health Kalyani Publishers, Chennai.

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SEMESTER – VI

PRACTICAL – VIII

CREDITS: 3

DIET THERAPY

45Hrs

Planning and Preparation of diet for soft and liquid Diets

1. Planning and Preparation of diet for Typhoid
2. Planning and Preparation of diet for Obesity
3. Planning and Preparation of diet for Peptic Ulcer
4. Planning and Preparation of diet for Hepatitis
5. Planning and Preparation of diet for Cardiovascular diseases
6. Planning and Preparation of diet for Renal Diseases.
7. Planning and Preparation of diet for Diabetes Mellitus.
8. Visit to Dietetics Department in a Hospital

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Practical – VII

CREDITS: 3FOOD SERVICE MANAGEMENT

45Hrs

1. Planning physical layout of food service institutions, commercial, non commercial, school feeding, ICDS, etc.,
2. Quality food production and purchase and sale by the students.
3. Visit to mid day meal programmes and observation of food service.
4. Visits to food service institution to study layout and food service equipment.
5. Visits to dietetic department in hospital.

Reference:

1. Mohini Sethi and Surjeet Molhan Catering Mngement- An Integrated approach, Wiley Eastern Ltd., 1987.
2. The complete book of cooking equipment jules wikinson, 2nd edition, A CBI Book, Published by Reinhold Company, 1981.
3. Design and layout of food service facilities, jhon C. Birchfiel endorsed by the food service consultants society Internationsl 1988 by Van Nostrand Reinhold, 1981.
4. Kawala, K. 1963 Environmental sanitation in india, Lucknow publishing house.
5. Van Nostrand, Principles of food sanitation- II edition, AVI Book, Reinhold, New York.
6. Avery A, A Modern Guide to food service equipment, CBI Publishing Inc., 1980.
7. D.M.A. Arulanadam, Dr.K.S.Ramana, Financial Accounting, Himalayala Publishing House., 2000

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SEMESTER – VI

PAPER – VIII

CREDITS: 3

Elective B2 NUTRACEUTICALS AND FUNCTIONAL FOODS UNIT I

9 Hrs

a. Introduction: Background, status of Nutraceuticals and Functional Food market, Definitions, difference between Nutraceuticals and Functional foods, types of nutraceutical compounds and their health benefits, current Scenario.

UNIT II

9 Hrs

b. Nutraceuticals: Types of Nutraceuticals compounds – Phytochemical, Phytosterols and other bioactive compounds, Peptides and proteins, carbohydrates (dietary fibers, oligosaccharides and resistant starch), Prebiotics and synbiotics, lipid (conjugated Linoleic acids, omega 3 fatty acids replacers), vitamins and minerals; their sources and role in promoting human health.

UNIT III

9 Hrs

c. Functional Foods: cereals and cereal products, Milk and Milk products, Eggs, Oils, Meat and products, Sea foods, Nuts and oil seeds, Functional fruits and vegetables, Herbs and spices, Beverages (tea, wine etc)

UNIT IV

9 Hrs

d. Fermented foods (functional foods conti...): Fermented foods- their health benefits and role in condition like cardiovascular diseases, Hypertension, Diabetes etc. Future prospects of functional foods and Nutraceuticals and their potential for use in improving health. Development in processing of functional foods. Formulation and fabrication of functional foods.

UNIT V

9 Hrs

e. Legal Aspects: Stability of Nutraceuticals, safety, consumer acceptance and assessment of health claims, labeling, marketing and regulatory issues related to nutraceuticals and functional foods.

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SEMESTER – VI

Practical – VIII

CREDITS: 3

NUTRACEUTICALS AND FUNCTIONAL FOODS 45Hrs

Identification of various nutraceuticals and functional foods available in the market.

1. Estimation of chlorophyll content of green vegetables
2. Determination of lycopene in fruit and vegetables
3. Determination of total pectin in plant material
4. Estimation of crude fibre/ dietary fibre content in cereals and their products
5. Estimation of anthocyanins in food sample
6. Preparation and evaluation of probiotics and prebiotics foods

Reference:

1. Wildman REC, Handbook of Nutraceutical and Functional foods, CRC Press 2001
2. Ghosh D et al, Innovations in Healthy and Functional foods, CRC Press 2012
3. Pathak YV, Handbook of Nutraceuticals Volume 2, CRC Press 2011
4. Various journal of food technology, food science and allied subjects.