

# SRR & CVR Government Degree College

*An Autonomous & ISO 9001: 2015 Certified Institution:: Ranked by NIRF in 101-150 band at NIRF-2020 & 151-200 band in NIRF 2019*

*NAAC accredited Institution with grade B+ with C.G.P.A 2.6 during March, 2017*

## Machavaram, Vijayawada, Krishna District, AP-520 004 Department of Food Technology

*Syllabi for Courses in Semester I & II under CBCS with Learning Outcomes-based Curriculum Framework (LOCF)*

Title of the Course: Food and Nutrition

Common for 309: BSc MBF

Course Code :	FTN1328	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

### Course 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.

### Course Outcomes (Cos):

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

- Know the Functions of food
- Acquiring knowledge about macro and micronutrients and their functions.
- Know the consequences of deficiency of taking nutrients.
- Understand the 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, Classification of foods, Functions of food- Physiological, psychological and social, Food Groups, Food Pyramid, Concept of Balanced Diet according to ICMR.

### 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 CONSTITUENTS 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.

## 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
5. Dietary Assessment through 24hr recall method.

## **Recommended Readings**

1. Bamji MS, Krishnaswamy K, Brahmam, (2016) Textbook of Human Nutrition, 4<sup>th</sup> 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, 3<sup>rd</sup> edition, Sterling Publishers Pvt. Ltd.
4. RavinderChada and PulkitMathur, (2015). Nutrition – A Life Cycle Approach, 1<sup>st</sup> edition, Orient Black Swan Private Limited
5. Shubhangini A. Joshi, (2002). Nutrition and Dietetics, 2<sup>nd</sup> 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 (2<sup>nd</sup> revised and enlarged) Bappco.
8. VijayaKhader, (2000). Food, nutrition & health, Kalyani Publishers.

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA****Department of Food Technology****Title of the Course: Fundamentals of Food Technology- Syllabus for AY 2022-23**

Common for 309: BSc MBF

Course Code :	FTN2328	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

**Course Objectives:**

This course will enable the student to:

- understand the current trends in 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

- Understand the evolution and current trends of food processing
- 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.
- Get an overview of some of the methods of processing of plant and animal foods

**CONTENTS**

<b>UNIT - I Introduction</b>	(4 lectures)
Introduction to food technology, Scope and current trends in food technology.	
<b>UNIT - II Compositional, Nutritional and Technological aspects of Plant foods I.</b>	
Cereals and Millets	(8 lectures)
Structure and nutrient composition of cereals, gelatinization, gluten formation	
Pulses	(6 lectures)
Structure and nutrient composition of pulses, toxic constituents in pulses.	
Nuts and oil seeds	(6 lectures)
Nutritive value, types and functions of fats and oils	
<b>UNIT - III Compositional, Nutritional and Technological aspects of Plant foods II.</b>	
Fruits and Vegetables	(6 lectures)
Classification of fruits and vegetables, nutritive composition, enzymatic browning, names and sources of pigments, Dietary fibre. Post harvest changes in fruits and vegetables.	
Spices and Condiments – Nutritive value and functions	(4 lectures)
<b>UNIT - IV Compositional, Nutritional and Technological aspects of Animal foods</b>	
Flesh Foods - Meat, Poultry, Fish	(12 lectures)
Meat - Composition of meat, marbling, post-mortem changes in meat- rigor mortis, ageing of meat.	
Poultry - Structure of hen's egg, composition and nutritive value, characteristics of fresh egg, deterioration of egg quality.	
Fish - Classification of fish (fresh water and marine), composition and nutritive value of fish, characteristics of fresh fish, spoilage of fish- microbiological, physiological, biochemical.	
Milk and Milk Products	(6 lectures)
Nutritive composition of milk, An overview of types of market milk and milk products.	
<b>Unit - V Food Microbiology</b>	(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. Estimation of Gluten content of wheat flour with other flours
2. Microscopic structure of food starches
3. Study the Gelatinization behavior of starches
4. Effect of cooking on whole and split pulses and legumes
5. To study malting and germination.
6. Determination of smoking point of oils
7. Study enzymatic browning and its prevention
8. Identification of pigments in fruits and vegetables and influence of pH on them.
9. Quality inspection of animal foods.
10. Estimation of salt content in butter

### 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

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**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**

Department of Food Technology

**Title of the Course- Food Preservation Technology - Syllabus for AY 2022-23**

Common for 309; BSc MBF

Course Code :	FTN 3328	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

**Objectives:**

This course will enable the student to

- study the importance of microorganisms in food preservation
- study the role of preservatives in food preservation
- introduce the basics of various food processing and preservation technologies.

**Outcomes:**

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

- Know the role of microorganisms in food preservation and spoilage
- Understand the concept of different processing and preservation technologies
- Use specific preservation techniques for specific food preservation.
- Apply these preservative methods to avoid surplus wastage of seasonal foods.
- Apply various preservation methods in food industries.

## CONTENTS

### Unit 1: Food Preservation by Preservatives (15 lectures)

Definition, Scope and importance of Preservation – Principles of Food Preservation.

Food spoilage – Definition of food spoilage, causes, types – physical, enzymatic, chemical and biological spoilage.

Preservation by chemicals – types and their mechanism of preservation - Class I and Class II preservatives – mould inhibitors – parabens – epoxides – benzoic acid – propionic acid

Preservation by antioxidants, acidulants, antibiotics, sulphites and nitrates.

Preservation by Fermentation – applications – some industrial fermentation in food industries

### Unit II: Food Preservation by Low temperature (10 lectures)

Freezing and Refrigeration- Concept and method, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, dehydro freezing, effect of freezing on food.

Thawing - changes during thawing and its effect on food.

### Unit III: Food Preservation by high temperature (10 lectures)

Thermal Processing- types, blanching – methods- equipment – advantages and disadvantages.

Commercial heat preservation methods – Sterilization – method, type of equipment, effect on food – advantages and disadvantages

Pasteurization –types, type of equipment, effect on food – advantages and disadvantages.

Canning – Steps involved in canning – syruping, brining – canning of acidic and non acidic foods- types of equipment used for canning – effect on food - spoilage encountered in canned foods, types of containers used for canning

### Unit IV: Food Preservation by Moisture control (15 lectures)

Drying and Dehydration – Definition – bound moisture – unbound moisture – free moisture drying as a means of preservation, methods of drying – sun drying, mechanical dehydration, direct heat driers and indirect heat driers- merits and demerits, differences between drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying – changes and effects in constituents of food materials – shrinkage , case hardening- thermoplasticity – reconstitution properties, advantages and disadvantages, normal drying curve, types of driers used in the food industry – cabinet driers, tunnel drier, drum drier, spray drier, foam mat drying and vacuum drying.

Concentration – Methods of concentration – film evaporators – falling evaporators – flash evaporator –

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freeze concentration – ultra filtration and reverse osmosis - effect on food – advantages and disadvantages.

**Unit V: Food Preservation by Irradiation**

(10 lectures)

Food irradiation – forms of energy – ionizing and non-ionizing energy- units of radiation – methods and equipment – effects of radiation- direct and indirect effects – irradiation doses for treating various foods – advantages and disadvantages.

## PRACTICALS

1. Preservation of food by chemical preservatives
2. Determination of pH of different foods using pH meter.
3. Preservation of food using sterilization temperatures.
4. To perform blanching of different plant foods.
5. Study quality characteristics of foods preserved by drying.
6. Study quality characteristics of foods preserved by dehydration
7. Study quality characteristics of foods preserved by freezing
8. Drying of food using freeze drying
9. Drying of fruits and vegetables using driers
10. Estimation of moisture content of foods

### Recommended Readings

1. B. Srilakshmi, Food science, New Age Publishers, 2002
2. Meyer, Food Chemistry, New Age, 2004
3. Bawa. A.S, O.P Chauhan et al. Food Science. New India Publishing agency, 2013
4. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004
5. Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi, 1987

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**  
**Department of Food Technology**

**Title of the Course: Technology of Plant Foods- Syllabus for AY 2022-23**

Common for 309: BSc MBF

Course Code :	FTN 4328-1	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

**Objectives:**

This course will enable the student to

- teach technology of milling of various cereals
- impart technical knowledge of pulses and oilseeds refining
- teach processing of fruits and beverages.

**Outcomes:** At the end of the course the students will be able to

- Learn about machinery involved in processing of various food stuffs.
- Understand processing methods for various plant foods.
- 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.

**CONTENTS**

- UNIT 1: Technology of cereals and millets** (12 lectures)  
Rice Processing – Physicochemical properties, milling – conventional milling and modern milling  
Parboiling of rice – Steps in parboiling – effect of parboiling on milling, nutritional and cooking  
quality of rice, Advantages and disadvantages  
Ageing of rice.  
Processing of puffed rice and flaked rice  
Byproducts of rice  
Wheat Processing --Types, milling, flour grade, flour treatments and By-products.  
Corn – Milling (wet & dry).  
Processing of Malt.
- UNIT 2: Technology of pulses** (12 lectures)  
Processing of pulses - soaking, germination, fermentation, decortication and  
cooking. Milling of pulses - Dry milling, Wet milling.
- UNIT 3: Technology of oilseeds** (12 lectures)  
Processing of nuts and oilseeds - Extraction of oils and refining, Rancidity, Defatted flour,  
Protein concentrates and isolate
- UNIT 4: Fruits processing** (12 lectures)  
Principles of preservation of fruits, Processing of fruits - jams, jellies, squashes, cordials and  
marmalades. Effect of processing on pigments and nutrients
- UNIT 5: Beverages** (12 lectures)  
Classification of Beverages, Alcoholic and Non Alcoholic, Composition and processing of Beer,  
Wine, Tea, Coffee and Cocoa.

## PRACTICALS

1. Determine the physical properties of cereals
2. Study on cooking quality of rice
3. Study on milling of rice
4. Experiment on production of pasta
5. Experiment on parboiling of paddy
6. Determination of pigments
7. Test the pectin strength of different fruits and vegetables
8. To prepare a fruit squash
9. Effect of pH on cooking of vegetables and fruits
10. Visit to cereal processing unit

### Recommended Readings:

1. Kent, N.L. 2003. Technology of Cereal, 5th Ed. Pergamon Press.
2. Chakraverty. 1988. Post Harvest Technology of Cereals, Pulses and Oilseeds, revised Ed., Oxford & IBH Publishing Co. Pvt Ltd.
3. Marshall, Rice Science and Technology. 1994. Wadsworth Ed., Marcel Dekker, NewYork.
4. Manay, S. and Sharaswamy, M. 1987. Food Facts and Principles. Wiley Eastern Limited.

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**  
Department of Food Technology

Title of the Course: **Technology of Animal Foods - Syllabus for AY 2022-23**

Common for 309: BSc MBF

Course Code :	<b>FTN 4328-2</b>	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

**Objectives:**

This course will enable the student to

- understand need and importance of livestock, egg and poultry industry
- study processing and preservation of animal foods.
- understand technology behind preparation of various animal food products and byproduct utilization.

**Course Outcomes:**

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

- know the handling of animal foods.
- Understand about the various processing methods of livestock.
- Understand about the various processing methods of egg, milk and fish.
- handle different preservation techniques of animal foods to extend the shelf life.
- identify and develop number of by-products from animal foods

**CONTENTS**

**UNIT 1: Milk**

(12 lectures)

Physical properties, Processing of milk, sterilization, pasteurization, homogenization and centrifugation. Preservation of milk.

**UNIT 2: Processing of milk by products**

(12 lectures)

Processing of cheese, paneer, whey protein and ice creams, butter, ghee, evaporated milk, condensed milk, toned milk, dry milk and role of enzymes in milk products and fermented milk products.

**UNIT 3: Meat**

(12 lectures)

Slaughter process - Slaughter, inspection and grading, Antemortem examination of meat animals, slaughter of animals, dressing of carcasses, post-mortem examination of meat, meat curing. Sausages-processing. Methods to increase the tenderness of meat. Processing of meat.

**UNIT 4: Egg/Poultry****(12 lectures)**

Preservation of eggs. Quality identification of shell eggs. Factors affecting egg quality and measures of egg quality. Egg processing, Processing of egg powders. Processing and preservation of poultry

**UNIT 5: Seafood****(12 lectures)**

Fish - Selection, handling and cleaning, Preservation and Processing, extraction of fish protein concentrates. Fish liver oils.

**PRACTICALS**

1. To perform platform tests in milk. (Acidity, COB, MBRT, specific gravity, SNF)
2. To estimate milk fat by Gerber method.
3. Determination of proximate composition and biochemical properties of milk
4. Effect of fermentation on milk proteins
5. Estimation of quality of egg- half index, egg white drainage calculation.
6. Effect of salt, sugar and fat on the stability of egg white foam
7. Effect of temperature on the stability of a natural emulsion
8. Effect of pre-preparation techniques on meat tenderization
9. Cut out examination of canned fish.(Sardine, Mackerel, Tuna)
10. Visit to milk processing industry

**Recommended Readings**

1. De Sukumar, Outlines of Dairy Technology, Oxford University Press, Oxford. 2007.
2. Hall GM, Fish Processing Technology, VCH Publishers Inc., NY, 1992
3. Sen DP, Advances in Fish Processing Technology, Allied Publishers Pvt.Limited 2005
4. Shahidi F and Botta JR, Seafoods: Chemistry, Processing, Technology and Quality, Blackie Academic & Professional, London, 1994
5. Lawrie R A, Lawrie's Meat Science, 5th Ed, Woodhead Publisher, England, 1998
6. Parkhurst & Mountney, Poultry Meat and Egg Production, CBS Publication, New Delhi, 1997
7. Pearson & Gillet Processed Meats, 3 Ed, CBS Publication, New Delhi, 1997
8. Shai Barbut, Poultry Products Processing, CRC Press 2005
9. Stadelman WJ, Owen J Cotterill Egg Science and Technology, 4th Ed. CBS Publication New Delhi, 2002

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**  
**Department of Food Technology**

**Title of the Course: Food Quality Control and Analysis - Syllabus for AY 2022-23**

Common for 309: BSc MBF

Course Code :	<b>FTN 5328A1</b>	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

**Objectives:**

This course will enable the student to

- Deal with various sensory attributes of food
- To learn about physical and chemical contaminants in foods
- Get knowledge on food safety and standards, Food safety and hygiene

**Outcomes:**

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

- evaluate various sensory attributes of various food stuffs.
- apply the principles of food safety and quality control to assure the quality of food products.
- Identify various desirable and undesirable constituents in food
- monitor and evaluate the microbial and chemical contaminants in food
- get through knowledge on various food laws and standards

**CONTENTS**

**UNIT - 1 Food Quality, Assessment And Evaluation (12 lectures)**

Definition of sensory evaluation

Sensory perception; subjective/ organoleptic evaluation. – Sensory characteristics of food

Sensory tests – Reasons for testing food quality, Trained Panel Members, Testing Laboratory.

Types of tests – Difference tests, Rating tests, Sensitivity tests and descriptive flavour profile test

Objective methods of evaluation. – Tests used for objective evaluation – Physico-chemical methods, Microscopic Examination, Physical methods

**UNIT – 2 Food Safety (12 lectures)**

Intentional Adulteration

Incidental Adulteration

Types of hazards, biological, chemical, physical hazards  
Factors affecting Food Safety  
Importance of Safe Foods  
Physical Hazards with common examples  
Chemical Hazards(naturally occurring ,environmental and intentionally added ),  
Packaging material as a threat  
Impact on health  
Control measures  
Biological Hazard - Indicator Organisms  
Food borne pathogens and diseases: bacteria, viruses and eukaryotes  
Seafood and Shell fish poisoning  
Mycotoxins

**UNIT – 3 Management of Hazards****(10 lectures)**

Hygiene and Sanitation in Food Processing Establishments – Introduction, Sources of contamination, Control methods using physical and chemical agents  
Waste Disposal  
Pest and Rodent Control  
Personnel Hygiene  
Good manufacturing practices

**UNIT – 4 Food Additives****(14 lectures)**

Chemical, technological and toxicological aspects  
Risk assessment studies- Safety and quality evaluation of additives and contaminants  
Introduction, need of food additives in food processing and preservation.  
Characteristics and classification of food additives.  
Antimicrobial agents. -Nitrites, sulphides, sulphur di oxide, sodium chloride, hydrogen peroxide.  
Antioxidants - Introduction, mechanism of action, natural and synthetic antioxidants, technological aspect of antioxidants.  
Sweeteners- Introduction, importance, classification- natural and artificial, chemistry, technology and toxicology, consideration for choosing sweetening agents.  
Colors- Introduction, importance, classification- natural, artificial, and natural identical, FD&C Dyes and Lakes.

**UNIT – 5 Food Standards and Food Laws****(12 lectures)**

Food safety standards authority of India (FSSAI)  
General Principles of food safety, duties and functions, General provisions related to offences  
Voluntary Standards and certification system – BIS, AGMARK standard  
Food Standard and regulation agencies in India – CCFS, CFL  
International standards – Codex Alimentarius, HACCP

## PRACTICALS

1. Survey of different foods in market
2. Study the nutritional label information, adulterants, food standards etc
3. Peroxide value of oils
4. Adulterants in various food stuffs
5. Determination of different preservatives
6. Determination of different colors
7. Testing of adulterants in coffee
8. Subjective evaluation
9. Objective evaluation
10. Ink print test on porous foods like idli and cake

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**  
Department of Food Technology

**Title of the Course: Food Packaging - Syllabus for AY 2022-23**

Common for 309: BSc MBF

Course Code :	FTN 5328A2	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

**Objectives:**

This course will enable the student to

- To acquaint students with knowledge on food packaging and their application
- To know the functions of food packaging
- Identify the purpose and principles of food packaging

**Outcomes:**

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

- Apply knowledge on selection of food packaging material for various foods
- Apply various packaging techniques

**CONTENTS**

**UNIT-I**

(8 lectures)

Introduction to food packaging in India, need of packaging, Package requirements, package functions, classification of packaging, Hazards acting on package during transportation & Storage, packaging and labeling laws.

**UNIT-II**

(20 lectures)

A. Package Materials: paper as package material its manufacture, types, advantages corrugated and paper board boxes etc. Glass as package material, Manufacture, Advantages, disadvantages. Metal as package material manufacture, Advantages, disadvantages, Aluminum as package material, advantages and disadvantages.

B. Plastic as package material classification of polymers, properties of each plastics, uses of each plastics, chemistry of each plastic such as polyethylene, polypropylene, polystyrene, polycarbonate, PVC, PVDC, Cellulose acetate, Nylon etc.

C. Recent developments – Plastic crates, High barrier plastics, Retortable pouches, Micro-ovenable packages, Aseptic processing and packaging, Modified atmosphere packaging.

D. Shrink-wrap packaging and utilization of agricultural wastes.

**UNIT-III****(12 lectures)**

Lamination Coating and Aseptic packaging - Lamination, need of lamination, types, properties, advantages & disadvantages of each type Coating on paper & films, types of coatings. Need of coating, methods of coatings. Aseptic packaging-Need, Advantages, process, system of aseptic packaging and materials used in aseptic packaging. Machineries used in Packing foods.

**UNIT- IV****(12 lectures)**

Packaging of Specific Foods - bread, Biscuits, Coffee, Milk powder, egg powder, carbonated beverages, snack foods, R.T.S.beverages.

**UNIT-V****(8 lectures)**

Mechanical and functional tests on Package - Various mechanical and functional testes performed in laboratories on package boxes and package materials.

**PRACTICALS**

1. Classification of various packages based on material and rigidity
2. Measurement of thickness of paper, paper boards
3. Measurement of water absorption of paper, paper boards
4. Measurement of puncture resistance of paper and paperboard
5. Edible packaging of Food Samples.
6. Determination of WVTR of films
7. Identification of plastic films
8. Gas/Vacuum packaging of foods and shelf life studies
9. Determination of coating on package materials
10. Prepackaging practices followed for packing fruits and vegetables

**Recommended Readings**

1. Handbook of Package Engineering Joseph F. Hanlon
2. Fundamentals of Packaging F.A. Paine
3. Food Packaging Sacharow and Griffin
4. Principles of Food Packaging R. Heiss
5. Flexible Packaging of Foods A.L. Brody
6. Food Packaging and Preservation M. Mathouthi

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**  
**Department of Food Technology**

Title of the Course: Food Product Development and Marketing - Syllabus for AY 2022-23

Common for 309: BSc MBF

Course Code :	<b>FTN 6328B1</b>	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

## CONTENTS

### UNIT-I

#### INNOVATIONS IN PRODUCT DEVELOPMENT

Introduction to the Product development and formulation - Need for Product development  
 New Food Products - Definition, Classification, General characteristics of New food product – Classes of new Food products - Line extensions - Repositioning of existing products - New form of existing product - Reformulation - New packaging - Innovative products and Creative products and Value added products  
 Factors affecting food product development - Corporate factors - Market place factors, technological pressures - Governmental issues and legislations

### UNIT-II

#### STAGES/PHASES OF NEW PRODUCT DEVELOPMENT

Idea generation- Internal and External sources of ideas, Screening, Feasibility studies, Consumer research, Financial review, Product design and Formulation, Process development – Recipe development and scale up, Consumer trials, Test market, Quality assessment of new developed products - Sensory Evaluation, Shelf life Testing, Costing/pricing and economic evaluation of the product, Product launch.

### UNIT-III

#### FOOD PACKAGING AND LABELING:

Concepts, Definition, Significance, Principles - Functions - Requirements - Packages with special features of environmental safety, Packaging Materials – Classification, Packaging of foods - Fresh and processed, Primary Packaging Media – Properties and applications  
 Labeling procedures and protocols

### UNIT-IV

#### STANDARD AND SPECIALIZED NUTRITION PRODUCTS

Product development with reference to nutritional and health needs - Health foods, Sports drinks, Infant foods, Baby foods, Geriatric foods, Value added foods, Functional foods, Nutraceuticals, Pre-biotics and Pro-biotics, Herbal foods, Convenience foods.

**UNIT-V****PRODUCT COMMERCIALIZATION AND MARKETING**

Test Marketing; Evaluating results and analyzing

Entrepreneurship: Plant location, investment, Financing the project

Ethics in food product development

Intellectual property/Patents

**Practicals**

1. Market Survey, Consumer survey to identify new products in terms of :
  - a) Line Extension
  - b) Repositioning Existing Products
  - c) New form/Reformulation
  - d) New packaging of existing products
  - e) Innovative products Creative Products.
2. Identification of product for development
  - a) Concept
  - b) Market research concerned product development
3. Development and Screening the products, developing criteria for screening scaling up
4. Designing score card for sensory evaluation
5. Test Marketing
6. Development of a new Food Product, evaluation – Research Project.

**RECOMMENDED READINGS**

1. Fuller, G.W.(1994) New Food Product Development: From Concept to Market place CRC Press, New York.
2. Man, C.M.D. and James A.A.(1994) Shelf life Evaluation of Foods. Blackie Academic and Professional, London.
3. Shapton, D.A. and Shapton, N.F. (1991) Principles and Practices for the Safe Processing of Foods, Butterworth Heinemann Ltd, Oxford.
4. Graf, E. and Saguy, I.S. (1991), Food Product Development: From Concept to the Market Place, Van Nostrand Reinhold New York.
5. Oickle, J.G. (1990) New Product Development and Value Added. Food Development Division Agriculture, Canada.
6. Proc. Food Processors Institute: A key to Sharpening your Competitive Edge. Food Processors Institute, Washington, DC.
7. Mike Stringer and Colin Dennis, "Chilled foods A comprehensive guide" 2<sup>nd</sup> edition :Woodhead publishing limited, Cambridge, England, 2000.
8. Andrew J. Taylor, "Food Flavour Technology", Sheffield Academic Press, 2002.
9. Debashri Ray "Nutritional Challenge and Total Quality Management" 1<sup>st</sup> edition; Sarupand Sons, New Delhi, 2002.
10. Rita Singh "Food Biotechnology" Volume 1, 1<sup>st</sup> edition, Global Vision Publishing House, Delhi, 2004.
11. Rita Singh "Food Biotechnology" volume 2, 1<sup>st</sup> edition, Global Vision Publishing House, Delhi, 2004.

**SRR & CVR Government Degree College (Autonomous): VIJAYAWADA**  
Department of Food Technology

Title of the Course: **Baking and Confectionery Technologies - Syllabus for AY 2022-23**

Common for 309: BSc MBF

Course Code :	<b>FTN 5328B2</b>	Continuous Internal Assessment (CIA)	40
No. of Lecture Hours / Week	04	Semester End Evaluation (SEE)	60
Total Number of Lecture Hours	60	Total Marks	100
Practical Component	02 Hour/Week	Exam Hours	03

## CONTENTS

- UNIT - I** (12 Lectures)  
Baking - Definition, Principles of baking, classification of baked foods. Types of equipments in baking industry, cleaning and sanitizing methods of baking equipments, baking temperature of different products, operation techniques of different baking equipments.
- UNIT - II** (12 Lectures)  
Ingredients and Their Role in Baking - Flour, Yeast, sugar, egg, butter, salt, baking powder, colouring, flavouring agents. List of standard colouring and flavouring agents.
- UNIT - III** (12 Lectures)  
Preparation of baked foods - Quick breads, cakes and its varieties, different types of biscuits, cookies and pastries. Decoration of baked foods - Icing- Types of Icing used in different bakery product. Role of other ingredients used in icing.
- UNIT - IV** (12 Lectures)  
Types of packaging materials used for bakery products, method of packaging. Quality control- Quality control of raw material / finished products.
- UNIT - V** (12 Lectures)  
Baking unit/ plant layout & design of a baking unit sanitation and hygiene.

### Practicals

1. Preparation of pizza base and assessment of its quality
2. Preparation of bread and assessment of its quality
3. Preparation of buns and assessment of quality
4. Preparation of butter cake and assessment of its quality.
5. Preparation of sponge cake with icing and assessment of its quality.
6. Preparation of cookies and assessment of quality.
7. Preparation of biscuits and assessment of quality.
8. Visit to a baking industry and preparation of report.

**Recommended Readings**

1. Potter, N. Food Science, The AVI Publishing Co., Inc., West Port, Connecticut, 1975.
2. Modern Pastry Chab, Vol.I and II, A VI Publishing Co., Inc., West Port, Connecticut, 1977.
3. Dubey, S.C. (2007). Basic Baking 5th Ed. Chanakya Mudrak Pvt. Ltd.
4. Manay, S. & Shadaksharaswami, M. (2004). Foods: Facts and Principles, NewAge Publishers.
5. Raina et.al. (2003). Basic Food Preparation-A complete Manual. 3rd Ed.Orient Longman Pvt. Ltd.
6. Barndt R. L. (1993). Fat & Calorie – Modified Bakery Products, Springer US.
7. Samuel A. Matz (1999). Bakery Technology and Engineering, PAN-TECH International Incorporated.
8. Faridi Faubion (1997). Dough Rheology and Baked Product Texture,CBS Publications.
9. Baker's Handbook on practical Baking .Wheat Associates, USA, New Delhi.