

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

Programme Structure of 309
w.e.f Academic Year - 2021-22

STRUCTURE OF FOODTECHNOLOGY CORE SYLLABUS UNDER CBCS

YEAR	SEMESTER	COURSE	TITLE	MARKS	CREDITS
I	I	I	Food and Nutrition	100	04
			Practical – 1	50	01
	II	II	Fundamentals of Food Technology	100	04
			Practical – 2	50	01
II	III	III	Food Preservation Technology	100	04
			Practical – 3	50	01
	IV	IV	Technology of Plant Foods	100	04
			Practical – 4	50	01
		V	Technology of Animal Foods	100	04
			Practical – 5	50	01

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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 FTN1328: 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

CO 1: Know the Functions of food

CO 2: Acquiring knowledge about macro and micronutrients and their functions.

CO 3: Know the consequences of deficiency of taking nutrients.

CO 4: Understand the importance of non-nutrients in human nutrition

CO 5: Apply the concepts of nutrition and food and its relation to health.

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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 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.

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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, 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. 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. 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. Vijaya Khader, (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 2021-22**

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 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

- 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

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CONTENTS

- UNIT - 1 Introduction** (4 lectures)
Introduction to food technology, Scope and current trends in food technology.
- UNIT - II Compositional, Nutritional and Technological aspects of Plant foods I.**
- 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
- UNIT - III Compositional, Nutritional and Technological aspects of Plant foods II.**
- 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)
- UNIT - IV Compositional, Nutritional and Technological aspects of Animal foods**
- 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.
- 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 enzymatic browning and its prevention
2. Estimation of Gluten content of wheat flour with other flours
3. Study the Gelatinization behavior of starches
4. Effect of cooking on whole and split pulses and legumes
5. Determination of smoking point of oils

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 2021-22**

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
- 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.

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CONTENTS**Unit I: Food Preservation by Preservatives**

(15 lectures)

Definition, Importance of Preservation, Principles of Food Preservation, Food spoilage – types – physical, enzymatic, chemical and biological spoilage. Food Additives – Definition, types, Class I and Class II preservatives. Preservation by Fermentation.

Unit II: Food Preservation by Low temperature

(10 lectures)

Freezing and Refrigeration: Introduction to refrigeration, cold storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, dehydro freezing, introduction to thawing, changes during thawing and its effect on food.

Unit III: Food Preservation by high temperature

(10 lectures)

Thermal Processing- Commercial heat preservation methods: Sterilization, Pasteurization – definition, types, Canning – Steps involved, spoilage encountered in canned foods, types of containers used for canning and Blanching.

Unit IV: Food Preservation by Moisture control

(15 lectures)

Drying and Dehydration - Definition, drying as a means of preservation, methods of drying, merits and demerits, differences between sun drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry. Concentration – Principles and types of concentrated foods.

Unit V: Food Preservation by Irradiation

(10 lectures)

Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization.

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PRACTICALS

1. To perform blanching of different plant foods.
2. Concept of shelf life of different foods
3. To study the concept of Asepsis and sterilization
4. Determination of pH of different foods using pH meter.
5. Study quality characteristics of foods preserved by drying/dehydration/ freezing.
6. To perform pasteurization of fluids using different methods.

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 etal. 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

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Department of Food Technology

Title of the Course: **Technology of Plant Foods- Syllabus for AY 2021-22**

Common for 309: BSc MBF

Course Code :	FTN 4328	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 (mechanical & solvent extraction), parboiling, ageing of rice, by products.

Wheat Processing --Types, milling, flour grade, flour treatments (bleaching, maturing) and By-products.

Corn – Milling (wet & dry).

Processing of Malt.

(12 lectures)

UNIT 2: Technology of pulses

Processing of pulses - soaking, germination, fermentation, decortication and cooking.

Milling of pulses - Dry milling, Wet milling.

(12 lectures)

UNIT 3: Technology of oilseeds

Processing of nuts and oilseeds - Extraction of oils and refining, Rancidity, Defatted flour, protein concentrates and isolates.

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UNIT 4: Fruits processing

Principles of preservation of fruits, Processing of fruits - jams, jellies, squashes, cordials and marmalades. (12 lectures)
 Effect of processing on pigments and nutrients

UNIT 5: BEVERAGES

Classification of Beverages, Alcoholic and Non Alcoholic, Composition and processing of Beer, Wine, Tea, Coffee and Cocoa. (12 lectures)

PRACTICALS

1. Estimation of starch
2. The peroxide value of oils
3. Determination of pigments
4. Test the pectin strength of different fruits and vegetables
5. To prepare a fruit squash
6. To prepare jam

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, New York.
4. Manay, S. and Sharaswamy, M. 1987. Food Facts and Principles. Wiley Eastern Limited.

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Title of the Course: **Technology of Animal Foods - Syllabus for AY 2021-22**

Common for 309: BSc MBF

Course Code :	FTN 5328	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 food

CONTENTS

UNIT 1: Milk

(6 lectures)

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

UNIT 2: Processing of milk by products

(6 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.

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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.
Prawns – Processing of prawns
Crabs – Processing of crabs
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. Cut out examination of canned fish.(Sardine, Mackerel, Tuna)
4. Estimation of protein content of meat
5. Estimation of quality of egg- half index, egg white drainage calculation.

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

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