

THREE YEAR DIPLOMA

PROGRAMME

IN

FOOD

TECHNOLOGY

(THIRD SEMESTER)

CURRICULUM OF THREE-YEAR DIPLOMA COURSES IN POLYTECHNICS
OF UT OF J&K

SUBJECT STUDY SCHEME (3rd Semester: Food Technology)										
S. No	Code	Course Title	Hours per Week				CREDITS			
			L	T	P	TOTAL	Th	Tu	Pr	TOTAL
01	FTPC-301	Food Microbiology	2	0	0	2	2	0	0	2
02	FTPC-302	Food Microbiology-Lab	0	0	2	2	0	0	1	1
03	FTPC-303	Open Elective- I	2	0	0	2	2	0	0	2
04	FTPC-304	Technology Of Cereal And Pulses	2	0	0	2	2	0	0	2
05	FTPC-305	Technology Of Cereal And Pulses-Lab	0	0	2	2	0	0	1	1
06	FTPC-306	Dairy Technology-I	2	0	0	2	0	0	0	2
07	FTPC-307	Dairy Technology-I	0	0	2	2	0	0	1	1
08	FTPC-308	Handling, Transportation , Storage And Supply Chain Management Of Foods	2	0	0	2	2	0	0	2
09	FTPC-309	Handling, Transportation , Storage And Supply Chain Management Of Foods- Lab	0	0	4	4	0	0	2	2
10	FTPC-310	Technology Of Meat , Fish And Poultry Products	2	0	0	2	2	0	0	2
11	FTPC-311	Technology Of Meat , Fish And Poultry Products-Lab	0	0	4	4	0	0	2	2
12	FTPC-312	Principles Of Food Processing And Preservation	2	0	0	2	2	0	0	2
13	FTPC-313	Principles Of Food Processing And Preservation-Lab	0	0	2	2	0	0	1	1
TOTAL			14	0	16	30	14	0	8	22

HS	BS	PC	ES	PE	OE	MP	SL/PR	AU	TOTAL
0	0	20	0	0	02	0	0	0	22

PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course code : FTPC-301	Course Title: Food Microbiology
Semester : 3rd	Credits: 02
Hours Per Week: 2 (L: 2, T: 0, P: 0)	

COURSE OBJECTIVE:

This subject is aimed to develop an understanding among the students on various micro flora associated with food products and their beneficial role as well as deleterious effect on food products

COURSE CONTENT

1. Concept of Microbiology

Introduction, Definition, historical developments in microbiology and food microbiology and its significance. Microbial growth curve and factors affecting microbial growth.

2. Microbial spoilage of Animal based food products

Microbial Spoilage of milk, meat, fish, poultry and egg products.

3. Microbial spoilage of Plant based food products

Microbial Spoilage of cereals, fruits and vegetable products.

4. Food Borne Illnesses

Food borne pathogens, food poisoning, food infection and intoxication. Salmonella, Listeria, E.coli, Cholostridiumbotolinum, Shigella

5. Anti-Microbial Agents

Anti-microbial agents – physical and chemical agents – their mechanism of action.

COURSE OUTCOME

After completion of the course, the student will be able to:

- Comprehend the significance of microorganisms in food and learn about microbial growth curve
- Learn about microbial spoilage of milk, meat, fish, poultry and eggs.
- Learn about microbial spoilage of cereals, fruits and vegetables.
- Gain knowledge about food borne pathogens.
- Learn about anti-microbial agents.

INSTRUCTIONAL STRATEGY

This being one of the most basic subjects for the students of food technology, the teachers should lay a lot of emphasis on explaining the facts, concepts, principles and procedures involved in various topics. The students should be given appropriate tutorial exercises. Teachers should made use of chart and other appropriate media to support classroom instruction. Emphasis during the practical session should be on performance by individual students and teacher should develop instructional manual for various exercises to facilitate the students. Visits to some of the local industries and quality control centres may be arranged to demonstrate various aspects of basic microbiology to the students. Experts may be invited to deliver lecturers on latest developments in the field.

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RECOMMENDED BOOKS:

1. Essentials of Microbiology by KS Bilgrami; CBS.
2. Food Microbiology by WC Frazier; Tata McGraw Hill.
3. Modern Food Microbiology by James M Jay; CBS.
4. Bacteriology by Sale.
5. Standard Methods for Waste Water Analysis by APHA.
6. Basic Food Microbiology: Bannett , Chapman and Hall.
7. Food Microbiology by M.R. Adams.
8. Hand Book of Microbiology by Bisen.
9. Text Book of Fungi by Sharma.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	28
2	06	18
3	06	18
4	06	18
5	06	18
TOTAL	32	100

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PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course code : FTPC-302	Course Title : Food microbiology-lab
Semester : 3rd	Credits: 02
Hours Per Week: 4(L: 0, T: 0 P:4)	

COURSE OBJECTIVE:

This subject is aimed to develop an understanding among the students on various micro flora associated with food products and their beneficial role as well as deleterious effect on processed food products

LIST OF PRACTICALS:

1. Study of microscope.
2. Study of bacteria, yeast & moulds under Microscope.
3. Size determination of microorganisms under microscope.
4. Media preparation for fungi & bacteria.
5. Preparation of glass wares for sterilization.
6. Methods of sterilization-dry heat and moist heat.
7. Enumeration of bacteria in the media by pour plating spread plating and streaking techniques.
8. Gram staining of bacteria.

PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course code : FTPC-304	Course Title : Technology of cereals and pulses
Semester : 3rd	Credits: 02
Hours Per Week: 2(L:2, T:0, P:0)	

COURSE OBJECTIVE:

This subject is aimed at imparting knowledge and skills related to the processing techniques, value addition, and handling of processing equipment of cereal, pulses to the students, as the understanding of these aspects is essential for diploma holders in food technology to perform efficiently and effectively in the industry

COURSE CONTENT

1. Introduction

Status, production and major growing areas of cereals, pulses and oil seeds in India and world

Structure and chemical composition of cereals, pulses and oil seeds, anti-nutritional factors wherever applicable

2. Cereals and millets

2.1 Wheat: types of wheat, conditioning and tempering, types of wheat milling. Technology of pasta and extruded products

2.2 Rice: Varieties of rice, classification of rice based on various physical Parameters, parboiling, milling of rice, and factors affecting quality of rice products

2.3 Maize: Classification of maize, dry and wet milling of corn, preparation of corn flakes

2.4 Barley and sorghum: Grain characteristics, technology of malt production, milling, malting and popping of sorghum

2.5 Different millets and their chemical composition, processing and utilization

3. Pulses

Pretreatment of pulses for milling, milling of major pulses

4. By-product utilization of different milling industries

COURSE OUTCOME

After completion of the course, the student will be able to:

- 1.** Gain knowledge about status, structure and composition of major cereals.
- 2.** Learn about the different milling processes of cereals and millets
- 3.** Gain knowledge about the pretreatment and milling of pulses
- 4.** Learn about bi-products of cereals and pulse industry

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INSTRUCTIONAL STRATEGY

This being one of the most important subjects, teacher should lay emphasis on developing basic understanding of various concepts and principles and procedures involved herein. Suitable tutorial exercises may be designed by the teachers, which require students visit to various industries. Students may also be exposed to various National, BIS and international standards. Visits to the relevant industry for demonstrating various operations involved in the cereal, pulses, and oilseed processing is a must. Experts from the industry may be invited to deliver lectures on the latest technology. Knowledge from pollution control and devices for the same may be provided to the students. Wherever relevant, students may be made aware about safety aspects.

RECOMMENDED BOOKS:

1. Cereal Technology by Kent, CBS.
2. Wheat Chemistry and Technology by Y Pomeranz, AACC.
3. Post Harvest Technology of Cereals pulses and oilseeds by Chakraborty AC, IBH.
4. Rice Chemistry and Technology by Julian, AACC 88.
5. Chemistry of Technology of Cereals as Food and Feed by Matz.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted (Hrs)	Marks Allotted (%)
1	04	12
2	14	44
3	06	18
4	08	26
Total	32	100

PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code : FTPC-305	Course Title : Technology of cereals and pulses-lab
Semester : 3rd	Credits: 02
Hours Per Week: 2(L:2 T:0 P:0)	

COURSE OBJECTIVE:

This subject is aimed at imparting knowledge and skills related to the processing techniques, value addition, and handling of processing equipment of cereal, pulses to the students, as the understanding of these aspects is essential for diploma holders in food technology to perform efficiently and effectively in the industry

LIST OF PRACTICALS:

1. Determination of physical characteristics of (a) rice (b) wheat (c) pulses (d) maize (e) barley and sorghum (f) oil seeds.
2. Milling of wheat to study its effect on various physico-chemical properties.
3. Estimation of flour quality: Gluten, Ash, fat and moisture content.
4. Parboiling and milling of rice.
5. Pre-treatment and milling of pulses.
6. Preparation of Pasta products – Noodles, Macroni, Vermicelli (Sevian).
7. Preparation of ready-to-eat (RTE) food products by extrusion cooking technology.
8. Visits to flour mill, Rice Mill/Rice Sheller, Dhal Mill, Oil expelling Unit, Refining Units, Milling and Brewing Units.

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PROGRAM:THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code: FTPC-306	Course Title: Dairy Technology-I
Semester: 3rd	Credits: 2
Hours Per Week: 2(L: 2, T: 0,P: 0)	

COURSE OBJECTIVE:

This subject is aimed at developing an understanding of various process technologies and handling of equipment used in the processing and value addition of milk and milk products to the students.

COURSE CONTENT

1. Introduction

Status and scope of dairy industry in India

2. Fluid Milk

Definition of milk, composition, physical and chemical properties of milk constituents and nutritive value of milk, factors affecting composition of milk.

3. Types of milk

Physico-chemical properties of milk, Colour, flavour, taste, , boiling and freezing point, acidity and pH, viscosity.

4. Fluid Milk Processing

Receiving, Filtration and clarification, straining, standardization Homogenization and its effects

5. Pasteurization

Pasteurization and various systems of Pasteurization; LTLT, HTST, UHT methods. Shelf life of pasteurized, sterilized , reconstituted and flavored milks

6. Infant formula

Composition and manufacturing process .

COURSE OUTCOME

After completion of the course, the student will be able to:

- Learn about the status and scope of dairy industry.
- Learn about the composition and physical and chemical properties of milk.
- Gain knowledge about physico-chemical properties of milk constituents.
- Gain knowledge about processing of fluid milk.
- Gain knowledge about infant formula and its manufacturing.

RECOMMENDED BOOKS:

1. Milk and Milk Products by Eckles and Eckles, Tata McGraw-Hill Education Pvt. Limited; Outlines of Dairy Technology by Sukmar De, Oxford University Press, India
2. Dairy Plant System and Layout by Tufail Ashmed, McGraw-Hill Education

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(India) Pvt Ltd.

3. Principles of Dairy Technology by Woarner, Oxford University Press, India
4. Dairy Engineering by Forvall.
5. Milk & Milk Products by CBSE, Oxford and IBH Publishing Co., New Delhi
6. Chemistry & Testing of Dairy Products by Atherton Newlander, John Alvin Newlander Publisher: Westport.
7. Smit, Gerrit 2003 Dairy Processing: Improving Quality Wood Head Publishing limited

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted(Hrs)	Marks Allotted(%)
1	2	6
2	6	20
3	6	20
4	6	20
5	6	18
6	6	16
Total	32	100

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PROGRAM:THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code: FTPC-307	Course Title: Dairy Technology-I- Lab
Semester: 3rd	Credits: 02
Hours Per Week: 4(L:0,T:0,P:4)	

COURSE OBJECTIVE:

This subject is aimed at developing an understanding of various process technologies and handling of equipment used in the processing and value addition of milk and milk products in the students.

LIST OF PRACTICALS:

1. To conduct platform test of milk, MBRT, Resazurin.
2. Determination of SNF (Solids Not Fat), specific gravity by lactometer, total solids of milk by refractometer.
3. Testing efficacy of pasteurized milk.
4. Determination of moisture & fat content of milk.
5. Detection of adulterants in milk like water, urea, neutralizers, preservatives, sucrose starch.
6. Visits to different dairy plants.
7. To perform sampling of milk.
8. Determination of titrable acidity of milk.
9. Determination of fat by Garber method.

PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code : FTPC-308	Course Title: Handling, storage and supply chain management
Semester : 3rd	Credits: 02
Hours Per Week: 2(L: 2, T: 0 P: 0)	

COURSE OBJECTIVE:

This subject is aimed to develop an understanding among the students about various methods of handling, storage and supply chain management of food grains and perishables. It will also impart knowledge and skills as how to minimize post – harvest loss of food commodities

COURSE CONTENT

1. Introduction

Scope and importance of handling, transportation and storage of food and food products, post harvest losses

2. Grains

Preparation of grains for storage, Storage requirements, infestation control, mycotoxin, handling practices, causes of spoilage and their prevention, factors affecting quality of grain during storage and types of storage structures and facilities.

3. Fruits and Vegetables

Handling, storage, spoilage and prevention.

4. Animal Foods

Pre-slaughter handling of animals – their effects on quality of meat products, storage requirements.

Milk:-Collection, pre-cooling, handling and storage – their effects on quality of milk

Eggs:-Handling and grading, packaging, handling, pre-treatment and storage.

5. Cold Storage

Introduction to cold storage facilities & requirements for storage of different fruits and vegetables.

6. Introduction to supply chains in India

Types of food chains. Factors influencing food supply chains, inventory management, risks in food supply chain, managing supply chain risks, temperature control in supply chain.

7. Trends in food supply chains

Traceability and use of technology, food production, food processing in a technological context, food packaging in technological context.

COURSE OUTCOME

After the completion of the course, the student will be able to:

- Understand the handling, storage of food products and post harvest losses
- Learn about handling, storage and spoilage of grains
- Learn about, handling, storage and spoilage of fruits and vegetables.
- Gain knowledge about the handling, storage of milk, meat and eggs
- Gain knowledge about cold storage.
- Learn about food supply chains and managing supply chain risks
- Gain knowledge about various trends in food supply chains.

INSTRUCTIONAL STRATEGY

Teachers should prepare tutorial exercises for the students, involving visits to various food-processing units. These tutorials can be considered a mini projects. Students may be asked to bring specifications and catalogues from industries. Students may also be exposed to relevant National, BIS and international standards. An intensive exercise on actual workbench performance in the industries is recommended. Experts may be invited to deliver lectures on various themes. Use of audio-visual aids will also be useful for better conceptualization of various operations

RECOMMENDED BOOKS:

1. Handling, Transportation and Storage of Fruits and Vegetables by A Lloyd, Ryall Penizer (AVI Publications)
2. Proceedings of Regional Workshop on Warehouse Management of Stored Food Grains by Girish and Ashok Kumar (UNDP)
3. Modern Potato and Vegetable Storage by Volkind and Roslov (Amerind)
4. Controlled Atmospheric Storage of Fruits by MettelSkilv
5. Food Grains in Tropical and Sub Tropical Areas by Hall
6. Food Storage Part of a system by Sinha and Muir (AVI)
7. Post Harvest Technology of Fruits and Vegetables – Handling, Processing, Fermentation and Waste Management by LR Verma and VK Joshi; Indus Publishing com., New Delhi
8. Drying and Storage of Grains and Oilseeds by Brooker & Hall, CBS
9. Food supply chain management and logistics by samirdani, koganpage
10. Food supply chain management by Michael A. burlakis, paul W.H. weightman

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted (Hrs)	Marks Allotted (%)
1	2	6
2	6	18
3	4	12
4	8	26
5	2	6
6	8	26
7	2	6
Total	32	100

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PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course code : FTPC-309	Course Title : Handling, storage and supply chain management- lab
Semester : 3rd	Credits: 02
Hours per Week: 4(L: 0, T: 0, P:4)	

COURSE OBJECTIVE:

This subject is aimed to develop an understanding among the students about various methods of handling, storage of food grains and perishables. It will also impart knowledge and skills as how to minimize post – harvest loss of food commodities,

LIST OF PRACTICALS:

1. Sampling of stored food grains in godown (Silo).
2. Analysis of sampled grain for foreign matter like straw parities, rodent excreta and rodents & insects infected grains.
3. Demonstration of changes during storage of fresh fruits and vegetables in (a) traditional storage (b) modified storage system (c) controlled atmosphere.
4. Determination of changes in PH and acid values in storage of milk.
5. Visit to a public distribution system (PDS) showing storage facilities, warehouse, cold storage, refrigeration system and slaughter house etc.
6. Visit to demonstration of material handling systems in various food industries.
7. Visits to cold storage.

PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course code : FTPC-310	Course Title : Technology of Meat ,fish and poultry products
Semester : 3rd	Credits: 2
Hours Per Week: 2 (L: 2, T: 0, P: 0)	

COURSE OBJECTIVE:

This subject is included in the curriculum to impart basic knowledge and skills of various technologies and equipment used for production of raw as well as processed meat, fish and poultry products to the students.

COURSE CONTENT

1. Introduction

Introduction to Indian meat, fish and poultry industry

2. Preparatory operations of meat

Chemical composition and structure of muscle, Different types of slaughtering methods, Antimortem and post-mortem inspection of animal/slaughtered animal, Abattoir.

3. preservation methods of meat and meat products

curing, smoking, pickling, canning and sausage making

4. Handling and Dressing of Poultry

Inspection of poultry birds, dressing and preparation of ready to cook poultry, factors affecting the quality

5. Egg and Egg Product

Structure, chemical composition and nutritive value, preservation of whole egg and egg products, preparation of egg powder

6. Fish and Fish Products

Types of fish, composition and nutritive value, judging the freshness of fish, fish grading, smoking, pickling, salting and dehydration.

7. Frozen Storage

Frozen Storage of fresh and processed meat, poultry and fish.

COURSE OUTCOME

After the completion of the course the student will be able:

- Know about the concept of meat, fish and poultry industry
- Comprehend and analyse the preparatory operations of meat .
- Preservation methods of meat
- Know about the inspection, and preparation of ready to cook Poultry
- Gain the knowledge about the structure, chemical composition and preservation of egg
- Gain the knowledge about the types, chemical composition and preservation of fish and fish products
- Learn about the frozen storage of fresh and processed meat, fish and poultry.

INSTRUCTIONAL STRATEGY

This being one of the most important subject, teacher should lay emphasis on developing basic understanding of various concepts and principles and procedures involved herein. Suitable tutorial exercises may be designed by the teachers, which require students visit to various industries. Students may also be exposed to various

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National and international standards. Visits to the relevant industry for demonstrating various operations involved, in the fermentation of food, is a must. Experts from the industry may be invited to deliver lectures on the latest technology. Knowledge from pollution control and devices for the 98 same may be provided to the students. Wherever relevant, students may be made aware about safety aspects.

RECOMMENDED BOOKS:

1. Meat Science by Lawrie, Heinemann Educational Books Ltd., London.
2. Egg Science and Technology by Mountney, AVI Publish co. Westport
3. Egg Science and Technology by PC Pande, Vikas Publishing House (P) Ltd, New Delhi
4. Fish Processing and Preservation by CL Cutting (Agro Botanical Publisher)
5. Poultry, Meat and Egg Products by Parkursht and Mountney (CBS Publishers)
6. Fish and Fish Products by AL Winton, Hill Book Company U.K.
7. The Canning of Fish and Meat by RJ Footill and AS Lewis (Blackie Publishers)
8. Processed Meat by Pearson and Glite (CBS Publishers)
9. Fermented Meat by Campbell Platt and PE Cook (Blackie Publishers)
10. Fish Processing Technology by GM Hall (Blackie Publishers) 11. Introduction to Fish Technology by JM Regenstein and CE Regusten (CBS publishers)

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted (Hrs)	Marks Allotted(%)
1	2	4
2	5	16
3	5	16
4	5	16
5	5	16
6	5	16
7	5	16
TOTAL	32	100

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PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code : FTPC-311	Course Title : Technology of meat, fish and poultry products- lab
Semester : 3rd	Credits: 2
Hours Per Week: 4 (L: 0, T:0, P:4)	

COURSE OBJECTIVE:

This subject is included in the curriculum to impart basic knowledge and skills of various technologies and equipment used for production of raw as well as processed meat, fish and poultry products, in the students

LIST OF PRACTICALS:

1. Demonstration of slaughtering and different cuts in a slaughter house.
2. Preparation of different types of meat products and their quality evaluation.
3. Dehydration of meat.
4. Preparation of ready to cook poultry.
5. Wholesale and retail cuts of dressed chicken.
6. Calculation of Hough unit of egg.
7. Preparation of chicken nuggets.
8. Determination of moisture and solid content of different egg constituents.
9. Canning of meat and meat products.
10. Preparation of meat pickle.
11. Candling and grading of eggs.
12. Preservation of whole eggs.
13. Visit to slaughter houses and abattoir.

PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code : FTPC-312	Course Title : Principles of Food Processing And Preservation
Semester : 3rd	Credits: 02
Hours Per Week: 2(L: 2, T: 0, P: 0)	

COURSE OBJECTIVE:

Knowledge and skills related to food processing and preservation are essential for the diploma holder in food technology. In this subject, students are exposed to various techniques of food preservation such as low temperature, high temperature, moisture removal, chemicals and radiation preservation. Relevant skills will also be imparted through this subject.

COURSE CONTENT

1. Scope and trends in food industry

Status of Indian food industry with emphasis on State of Haryana. Definition of food – food technology, food science, food preservation and food engineering – basic considerations. Importance of food processing and preservation. Classification of foods on the basis of shelf life, pH, origin; Different types of food spoilage viz. microbiological, bio-chemical, chemical, physical and their effects on food quality, principles of food preservation

2. Preservation by sugar and salt

Principles of Salt and sugar preservation, Intermediate Moisture Food (IMF)

3. Preservation by Low Temperature

Low temperature required for different foods – refrigeration – refrigeration load, refrigeration systems; slow and fast freezing, freezing process; types of freezer advantages and disadvantages of freezing; storage and thawing of frozen food

4. Preservation by High Temperature

Pasteurization, Sterilization, Canning: their Definition, Method, advantages and disadvantages,

5. Moisture Removal

Evaporation, Concentration, drying and dehydration, types of dryers, advantages and disadvantages, selection of dryers,

6. Food Additives including Chemical Preservatives-

Classification, functions and uses in foods

7. Preservation of foods by Radiation –

Irradiation of foods, Radiation doses for spices, onions, potatoes and meat. Concept of microwave heating effect on food quality.

COURSE OUTCOME

After the completion of the course the student will be able:

- Know about the basic principles of food preservation
- Gain knowledge about class I preservation
- Gain knowledge about preservation methods used by low temperature
- Know about the preservation methods using high temperature
- Gain the knowledge about the moisture removal methods in different foods
- Gain the knowledge about the chemical preservatives used in food preservation
- Gain knowledge about the preservation by radiation

INSTRUCTIONAL STRATEGY

This being one of the most basic subjects for the students of food technology, the teachers should lay a lot of emphasis on explaining the facts, concepts, principles and procedures involved in various topics. The students should be given appropriate tutorial exercises. Teachers should make use of chart and other appropriate media to support classroom instruction. Emphasis during the practical session should be on performance by individual students and teacher should develop instructional manual for various exercises to facilitate the students. Visits to some of the local industries and quality control centers may be arranged to demonstrate various aspects of food technology and preservation and principles involved therein to the students. Experts may be invited to deliver lectures on latest developments in the field.

RECOMMENDED BOOKS:

1. Food Science by NN Potter, CBS publishers, New Delhi
2. Technology of Food Preservation by Desrosier, The Avi Publishing Company, Inc., Westport
3. Principles of Food Science Vol. – I by Fennema, Karrel, McGraw-Hill BookCompany, New York
4. Preservation of Fruits and Vegetables by Girdhari Lal, Sidhapa and Tandon, CBS Publishers, Delhi
5. Hand book of Analysis of Fruits and Vegetables by S Ranganna, Tata Me Graw- Hill. Publishing Company, New Delhi
6. Fruits and Vegetable Processing by Cruss, Oxford and IBH Publishing Co., New Delhi
7. Food Science by Mudambi, New Age International Pvt Ltd Publishers, New Delhi
8. Basic Food Preparation(Manual)
9. Fruit & Vegetable Processing by Bhatt, Verma, Tata Mc Graw Hill Publishing Company Limited,. New Delhi
10. Commercial Vegetable Processing by Woodroof, vannostrand Reinhold, New York
11. Preservation of Fruits & Vegetables by IRRI, Oxford & IBH Publishing, New Delhi
12. Food Canning Technology by Larcousse& Brown
13. Food Composition & Preservation by Bhawna Sabarwal, Commonwealth Publishers 1999, New Delhi.
14. Food Preservation by S.K. Kulshrestha, vikaspublishing house Pvt. Ltd., New Del
15. Processing Foods by Oliverra, CRC Press, New York

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- 16.** Principles & Practices for the Safe Processing of Foods by Heinz, H J *Heinz* Company, UK.

UNIT WISE TIME AND MARKS DISTRIBUTION

Unit No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	20
2	04	12
3	04	12
4	04	12
5	06	20
6	04	12
7	04	12
Total	32	100

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PROGRAM : THREE YEAR DIPLOMA PROGRAM IN FOOD TECHNOLOGY	
Course Code : FTPC-313	Course Title : Principles of Food Processing And Preservation-lab
Semester : 3rd	Credits: 01
Hours Per Week: 2(L:0,T:0, P:2)	

COURSE OBJECTIVE:

Knowledge and skills related to food processing and preservation are essential for the diploma holder in food technology. In this subject, students are exposed to various techniques of food preservation such as low temperature, high temperature, moisture removal, chemicals and radiation preservation. Relevant skills will also be imparted through this subject

LIST OF PRACTICALS

1. Study of changes in fruits/vegetables during storage
2. Peeling of fruits and vegetables
3. Preparation of brine and syrup
4. Blanching of seasonal fruits and vegetables
5. Dehydration of fruits & vegetables
6. Preparation of fruit bars
7. Freezing of seasonal vegetables, meat and fish products
8. Preparation of Jam, Jelly & squash
9. Pickle preparation
10. Storage of frozen products
11. Preparation of sauerkraut
12. Visit to fruits and vegetable industry to see above operations