

**Scheme of Teaching and Examination for  
4<sup>th</sup> Semester of 3 Years Diploma in Food Technology**

Duration of Semester : **14 Weeks**  
Student Contact Hours : **36 Hrs**  
Total Marks : **800**

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Technology of Serials & Pulses	FTC402	Theory	3	-	-	3	100	80	20	26	40
2.	Technology of Milk Products, Fruits & Vegetables	FTC403	Theory	3	-	-	3	100	80	20	26	40
3.	Technology of Meat, Fish, Poultry Product and Non Alcoholic Beverages	FTC404	Theory	3	-	-	3	100	80	20	26	40
4.	Food Fermentation Technology, Bakery and Confectionary Technology	FTC405	Theory	3	-	-	3	100	80	20	26	40
5.	Principles of Food Energy, Health and Functional Foods	FTC406	Theory	3	-	-	3	100	80	20	26	40
6.	Technology of Serials & Pulses Lab	FTC407	Sessional	-	-	2		50	30	20		25
7.	Technology of Milk Products, Fruits & Vegetables Lab	FTC408	Sessional	-	-	2		50	30	20		25
8.	Technology of Meat, Fish, Poultry Product and Non Alcoholic Beverages Lab	FTC409	Sessional	-	-	2		50	30	20		25
9.	Food Fermentation Technology, Bakery and Confectionary Technology Lab	FTC410	Sessional	-	-	2		50	30	20		25
10.	Principles of Food Energy, Health and Functional Foods Lab	FTC411	Sessional	-	-	2		50	30	20		25
11.	PPR	401	Sessional	-	-	4		50	30	20	-	25
<b>Total Hours of Teaching per week :</b>				<b>15</b>		<b>14</b>						

Total Marks : Theory : Practical : Sessional :  
L : Lecture, T : Tutorial P : Practical

- Note:
1. Period of Class hours should be of 1 hrs duration as per AICTE norms.
  2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.
  3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.
  4. Board will depute examiner for Practical examination.
  5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

# TECHNOLOGY OF CEREALS AND PULSES

**Subject Code : FTC402**

**Full Marks 100 (80+20)**

L	T	P
3	–	2

## RATIONALE

This subject is aimed at imparting knowledge and skills related to the processing techniques, value addition, and handling of processing equipment of cereal, pulses and oil seeds 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

## DETAILED CONTENTS

1. Introduction (6 hrs)  
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 (22 hrs)
  - 2.1 Wheat: types of wheat, conditioning and tempering, types of wheat milling technology, 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 (07 hrs)  
Pretreatment of pulses for milling, milling of major pulses
4. By-product utilization of different milling industries (7 hrs)

### 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,
4. Rice Chemistry and Technology by Julian, AACC
5. Chemistry of Technology of Cereals as Food and Feed by Matz



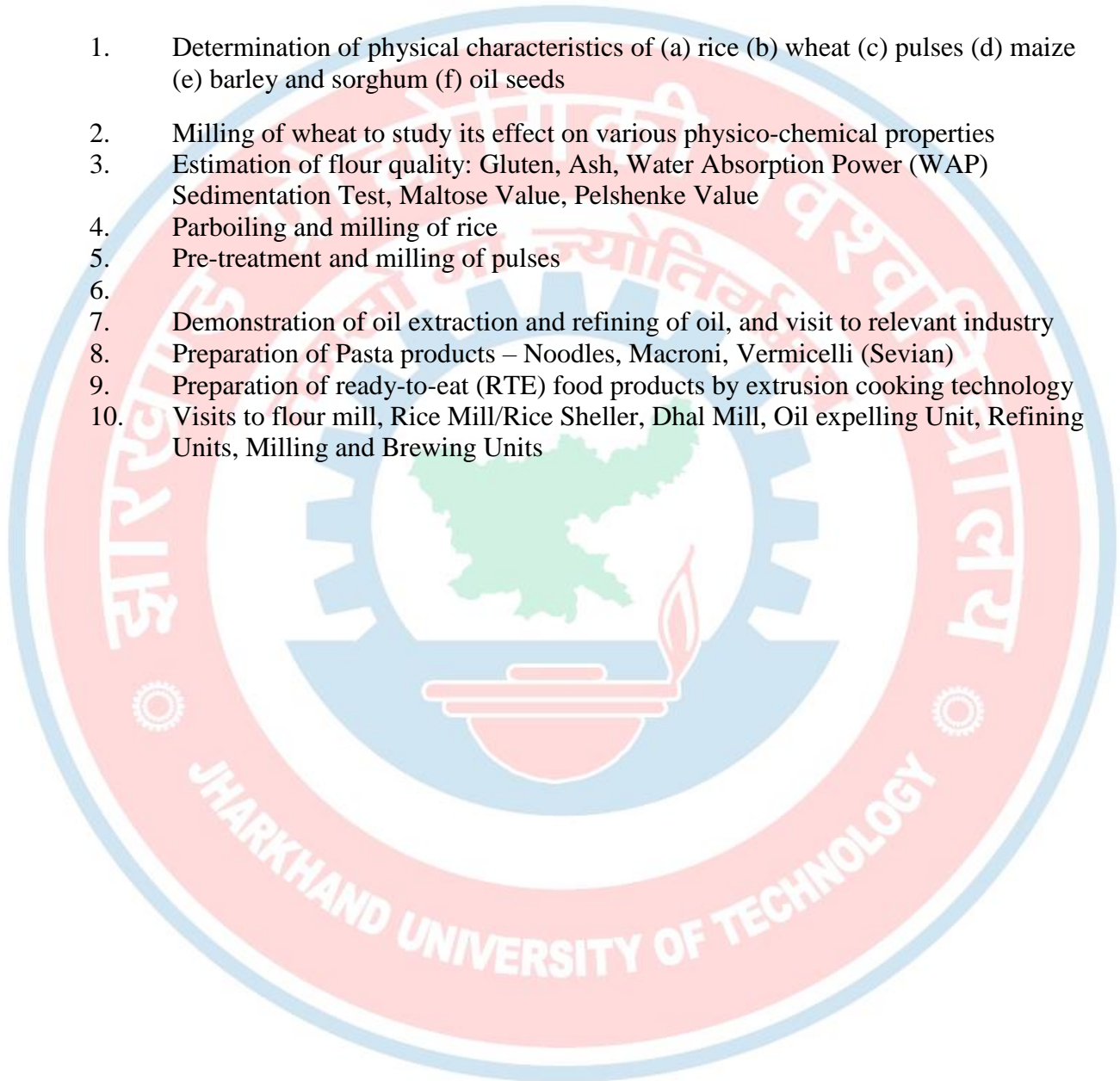


# TECHNOLOGY OF CEREALS AND PULSES

**Subject Code : FTC407**

## 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, Water Absorption Power (WAP) Sedimentation Test, Maltose Value, Pelshenke Value
4. Parboiling and milling of rice
5. Pre-treatment and milling of pulses
- 6.
7. Demonstration of oil extraction and refining of oil, and visit to relevant industry
8. Preparation of Pasta products – Noodles, Macroni, Vermicelli (Sevian)
9. Preparation of ready-to-eat (RTE) food products by extrusion cooking technology
10. Visits to flour mill, Rice Mill/Rice Sheller, Dhal Mill, Oil expelling Unit, Refining Units, Milling and Brewing Units



# TECHNOLOGY OF MILK AND MILK PRODUCTS, FRUITS AND VEGETABLE PRODUCTS

**Subject Code : FTC403**

**Full Marks : 100 (80+20)**

L T P

3 – 2

## RATIONALE

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

### TECHNOLOGY OF MILK AND MILK PRODUCTS

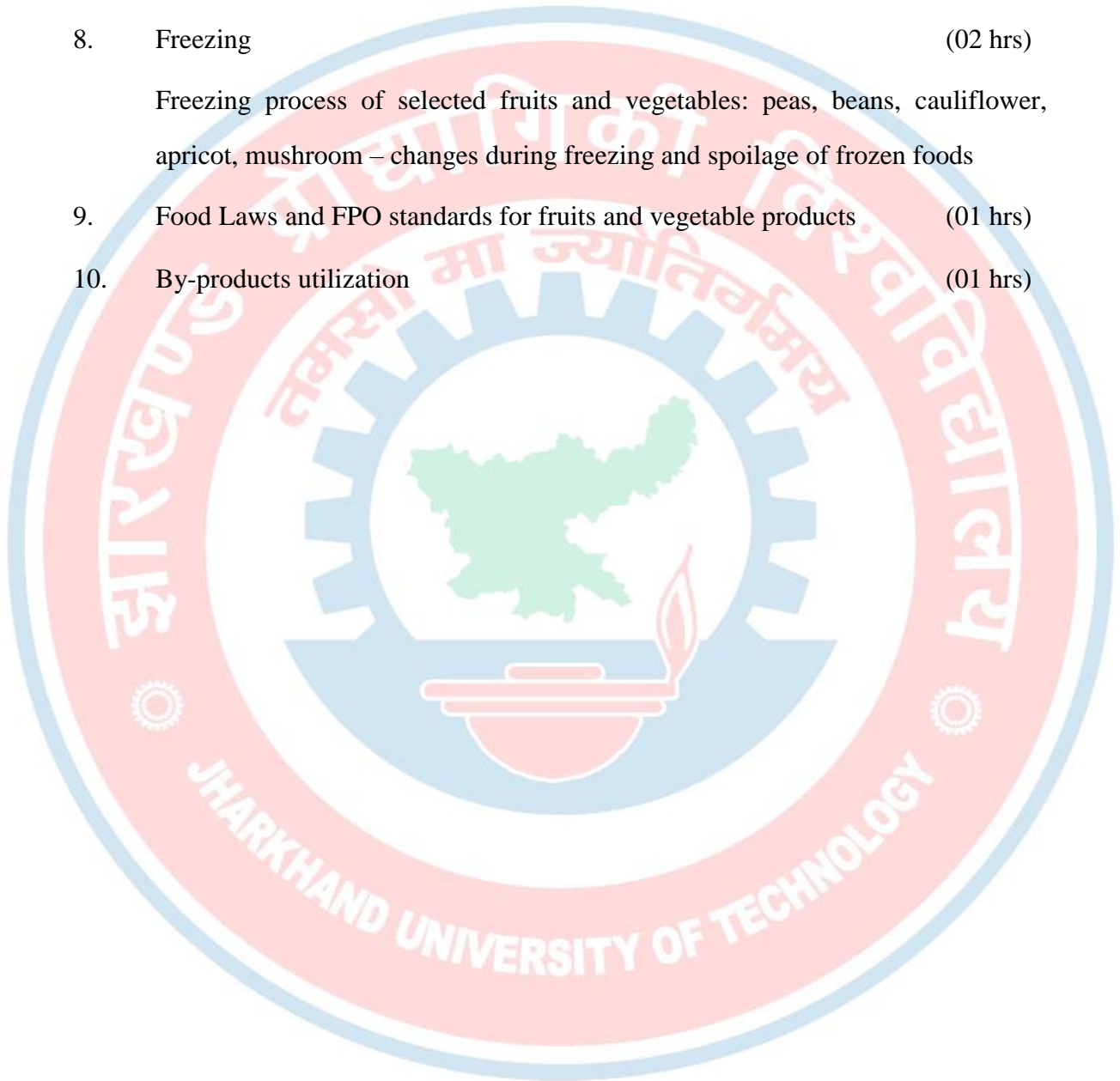
1. Introduction – Status and scope of dairy industry in India (02 hrs)
2. Fluid Milk Definition of milk, composition, physical and chemical properties of milk constituents and nutritive value of milk, factors affecting composition of milk, types of milk, Physico-chemical properties of milk: Colour, flavour, taste, specific gravity, & density, boiling and freezing point, refractive index, acidity and pH, viscosity, surface tension, thermal conductivity. Basis for pricing of milk (04 hrs)
3. Quality control tests Platform tests like-smell, appearance, temp, sediment, acidity, lactometer reading Chemical/Laboratory test: Acidity, PH, alcohol, fat, SNF, etc Microbiological: SPC, MBRT, Resazurin tests etc. (02 hrs)
4. Fluid Milk Processing Receiving Filtration and clarification, straining standardization Homogenization and its effects, Pasteurization: and various systems of Pasteurization; LTLT, HTST, UHT methods, Pasteurizers (Heating system, cooling system, flow controller, regenerator, flow division valve) sterilization, packaging of fluid milk. (03 hrs)
5. Coagulated Milk Products Channa, paneer, classification and manufacturing process of cheese (02 hrs)
6. Cream/Butter/Ghee – Manufacture and storage of butter and ghee (02 hrs)
7. Condensed Milk, Types and factors affecting the quality of condensed milk, storage of condensed milk (02 hrs)

- 8 Dry Milk Products Methods of drying milk (Drum and Spray drying), factors affecting the quality of dry milk. Introduction to instant non-fat dry milk packaging of dry milk products (02 hrs)
- 9 Frozen Products Manufacturing of and ice cream; factors affecting the quality of frozen products (01 hrs)
- 10 Cleaning and sanitation of dairy plant and equipment (02 hrs)
- 11 Utilization of by-products of milk processing industry: skim milk, butter milk, whey, casein (02 hrs)

### **FRUITS AND VEGETABLE PRODUCTS**

1. Introduction (02 hrs)  
Status and scope of fruits and vegetables industry in India, classification, composition and nutritive value of fruits and vegetables
2. Preparatory Operations and Related Equipments (02 hrs)  
Cleaning, sorting, grading, peeling and blanching methods
3. a) Ingredients and processes for the manufacture of: (02 hrs)  
i) jam, jellies, marmalade, preserves, (ii) pickles and chutneys  
b) Defects and factors affecting the quality of above
4. Tomato Products (02 hrs)  
Ingredients and their role, process for the manufacture of tomato ketchup, sauce, puree and paste.
5. Juices (02 hrs)  
Raw materials, extraction, classification, processing and aseptic packaging
6. Thermal Processing of Fruits and Vegetables (02 hrs)  
History, definition, various techniques of thermal processing and their effects on the quality of fruits and vegetable products, types of containers and their selection, spoilage of canned foods
7. a) Dehydration of fruits; equipment and process for dehydration of plums, apricot, apple, fig, grapes peach etc (02 hrs)

- b) Dehydration of Vegetables: equipment and process for dehydration of peas, cauliflower, potato, methi, mushroom, tomato etc
  - c) Osmo-dehydration – basic concept and applications
8. Freezing (02 hrs)
- Freezing process of selected fruits and vegetables: peas, beans, cauliflower, apricot, mushroom – changes during freezing and spoilage of frozen foods
9. Food Laws and FPO standards for fruits and vegetable products (01 hrs)
10. By-products utilization (01 hrs)





# TECHNOLOGY OF MILK AND MILK PRODUCTS, FRUITS AND VEGETABLE PRODUCTS

**Subject Code : FTC408**

## LIST OF PRACTICALS

1. To conduct platform test of milk
2. Determination of SNF (Solids Not Fat), specific gravity, total solids of milk.
3. Testing efficacy of pasteurized milk
4. Determination of moisture & fat content of milk powder
5. Study of familiarization with various parts and working of cream separator
6. Preparation of Khoa
7. Detection of adulterants in milk like water, urea, neutralizers, preservatives, sucrose starch
8. Preparation of channa and paneer
9. Preparation of ice cream
10. Visits to different dairy plants
11. To perform sampling of milk
12. Determination of titrable acidity of milk
13. Determination of fat by garber method
14. Analysis of milk with the help of electronic milk tester
15. Orientation to different processing equipments, their functions and uses
16. Preparation of Jam, jelly and preserve
17. Preparation of pickle by various methods
18. Preparation of chutney
19. Extraction of tomato juice by hot and cold break methods
20. Preparation of tomato sauce/ketchup
21. Preparation of tomato puree/paste
22. Extraction of juice by various methods
23. Bottling and processing of fruit juice
24. Preparation of syrup and brine solutions
25. Dehydration of peas, potatos
26. Dehydration of grapes and apples
27. Freezing of peas
28. Preparation of tomato powder
29. Visits to different fruit and vegetable processing industries

## RECOMMENDED BOOKS

1. Milk and Milk Products by Eckles and Eckles, *Tata McGraw-Hill Education Pvt. Limited;*
2. Outlines of Dairy Technology by Sukmar De, Oxford University Press, India
3. Dairy Plant System and Layout by Tufail Ashmed, McGraw-Hill Education (India) Pvt Ltd
4. Principles of Dairy Technology by Woarner, Oxford University Press, India
5. Dairy Engineering by Forvall
6. Milk & Milk Products by CBSE, Oxford and IBH *Publishing Co.*, New Delhi



7. Chemistry & Testing of Dairy Products by Atherton Newlander, John Alvin  
*Newlander Publisher: Westport*
8. Fruits and Vegetable Preservation by Girdhari Lal and Sidappa; ICAR  
(New Delhi)
9. Preservation of Fruits and Vegetable by Srivastava; IBD Co., Lucknow
10. Preservation of Fruits and Vegetable by Vijaya Khader; Kalyani  
Publication
11. Post Harvest Technology of Fruits and Vegetables – Handling, Processing,  
Fermentation and Waste Management y LR Verma and VK Joshi
12. Processing Fruits: Science & Technology vol 1-2 by Somogyi
13. Processing Vegetables: Science & Technology vol 1-2 by Somogyi
14. The Technology of Food Preservation by Desrosier
15. Food Science by Potter
16. Food Science by Mudambi
17. Basic Food Preparation( Manual)
18. Fruit & Vegetable Processing by Bhatt, Verma
19. Commercial Vegetable Processing by Woodroof
20. Preservation of Fruits & Vegetables by IRRI
21. Food Canning Technology by Larcousse & Brown
22. Food Composition & Preservation by Bhawna Sabarwal
23. Food Preservation by S.K. Kulshrestha
24. Processing Foods by Oliverra



## TECHNOLOGY OF MEAT, FISH AND POULTRY PRODUCTS AND NON ALCHOLIC BEVERAGES

SUBJECT CODE : FTC404

FULL MARKS -100(80+20)

L T P

3 – 2

### RATIONALE

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

### TECHNOLOGY OF MEAT, FISH AND POULTRY PRODUCTS

1. Introduction to Indian meat, fish and poultry industry (02 hrs)
2. Preparatory operations of meat and meat products (10 hrs)  
Composition of muscle, Different types of slaughtering methods, Different types of meatents, Antimortam and post-mortem inspection of animal/slaughtered animal, Abattoir – Definition and construction; basic preparatory procedures (culmination, emulsification, pre-blending) Cured and smoked meats, sausage products – classification, processing steps, and canned meat, meat pickles
3. Handling and Dressing of Poultry (02 hrs)  
Inspection of poultry birds, dressing and preparation of ready to cook poultry, factors affecting the quality
4. Egg and Egg Products (03 hrs)  
Structure, chemical composition and nutritive value, spoilage of eggs and preservation of whole egg and egg products, preparation of egg powder
5. Fish and Fish Products (03 hrs)  
Types of fish, composition and nutritive value, judging the freshness of fish, fish

grading and cooking of fish, smoking, pickling, salting and dehydration,  
preservation of fish and processed fish products

6. Frozen Storage of fresh and processed meat, poultry and fish (02 hrs)
7. By-products of meat, fish, poultry and egg industry (02 hrs)

### **NON ALCHOLIC BEVERAGES**

1. Introduction – Status of Bakery industry in India (02 hrs)
2. Raw Materials for Bakery Products (02 hrs)  
Flour, sugar, shortening, yeast, salt and leavening agents as raw material for bakery products, their role and PFA specifications of these raw materials
3. Manufacturing of Bakery Products (8 hrs)  
Different types of bread and preparation of bread using different methods, quality evaluation of bread, staling of bread  
Different types of biscuits and preparation of biscuits using different methods, quality evaluation of biscuits  
Different types of cakes and pastries, preparation of cakes and pastries using different methods, quality evaluation of cakes, different types of toppings  
Preparation of other bakery products: rusks, crackers, buns, muffins, pizza and kulcha  
Types of additives used in bakery products
4. Confectionery Products (04 hrs)  
Introduction, classification of confectionery products, confectionery ingredients like starch, fats, colours, flavours additives. Brief account of sweeteners like Gur, refined sugar, beet sugar, white sugar and liquid sweeteners like Molasses, corn syrup, high fructose syrup, maple syrup. Reaction of sugar like caramelization, hydrolysis and crystallization, sugar boiled, chocolate and Indian confectionary
6. Layout, setting up of units and hygienic conditions required in bakery plant,



### 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*)
12. Bakery Engineering and Technology, Vol. I and II by Matz; *CBS*
13. Bakery Products Published by *SIRI*
14. Cereal Technology by Kent; *CBS*
15. Wheat Chemistry and Technology by Y Pomeranz
16. Basic Baking by SC Dubey
17. Practical Baking by William Sultan Vol. I and II
18. Practical Handbook of Bakery by *US Wheat Associates*

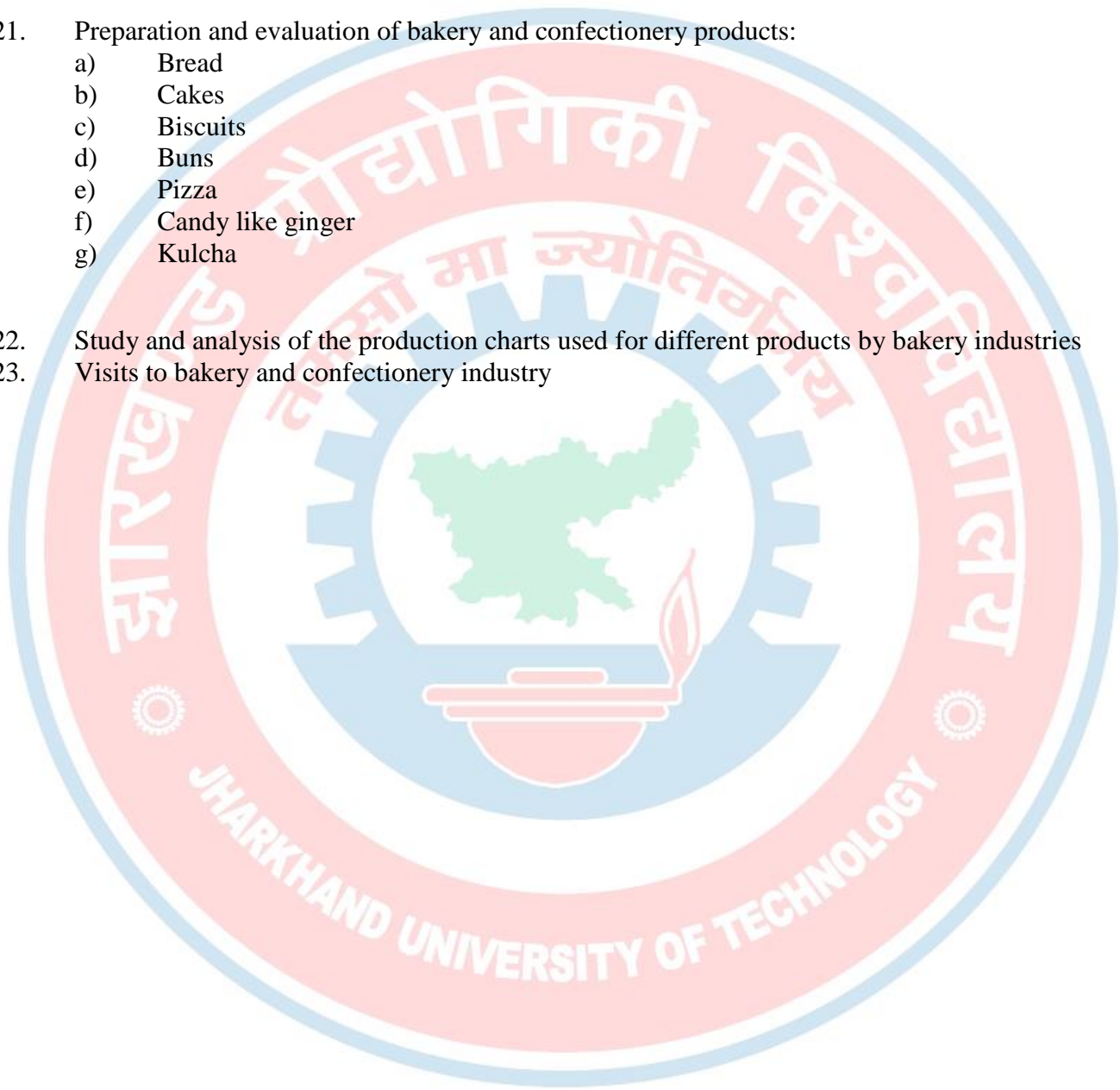
**TECHNOLOGY OF MEAT, FISH AND POULTRY PRODUCTS AND NON ALCHOLIC BEVERAGES LAB**

**SUBJECT CODE : FTC409**

**LIST OF PRACTICALS**

1. Demonstration of slaughtering and different cuts in meat at a slaughter house
2. Preparation of different types of meat products and their quality evaluation
3. Cutting of meat
4. Preparation of sausages
5. Calculation of shape and size index of egg
6. Preparation of ready to cook poultry
7. Retail cuts of dressed chicken
8. Calculation of hogg unit of egg
9. Measurement of air cell of egg
10. Determination of effect of temperature on coagulation of egg protein
11. Determination of moisture and solid content of different egg constituents
12. Determination of specific gravity of eggs
13. Preparation of egg powder
14. Preparation of fish, meat and egg pickle
15. Candling and grading of eggs
16. Iron sulphide formation in cooked eggs
17. Preservation of whole egg
18. Visit to slaughter houses and abattoir
19. Demonstration of filtering & staking of fish
20. Quality analysis of raw materials used in bakery and confectionery industry according to PFA standards

21. Preparation and evaluation of bakery and confectionery products:
  - a) Bread
  - b) Cakes
  - c) Biscuits
  - d) Buns
  - e) Pizza
  - f) Candy like ginger
  - g) Kulcha
22. Study and analysis of the production charts used for different products by bakery industries
23. Visits to bakery and confectionery industry





**FOOD FERMENTATION TECHNOLOGY, BAKERY &  
CONFECTIONARY TECHNOLOGY**

**SUBJECT CODE : FTC405**

L T P

3 – 2

**RATIONALE**

This subject is developed with an objective to impart knowledge and skills related to process technologies and equipment used for the production of various fermented food products to the students

**DETAILED CONTENTS**

**FOOD FERMENTATION TECHNOLOGY**

1. Introduction (02 hrs)  
Definition, advantages of fermentation and nutritive value of fermented food products
2. Type of fermentation processes; different substrates for fermentation process; pure cultures and their maintenance procedures (03 hrs)
3. Fermentor (03 hrs)  
Basic configuration, different parts – agitator/impellers, sparger, baffles, process control, functions
4. Technology of Fermented Products (6 hrs)  
Production of distilled beverages (whiskey, primary, rum), wine, beer, vinegar and bakers yeast
5. Fermented Foods (6 hrs)  
Production technology of curd, yogurt, idli, dosa, dhokla, srikhand, tempeh and miso, sauerkraut, butter milk, lassi, sausages
6. Single Cell Protein (4 hrs)  
Sources, micro-organism, process, nutritive value and advantages and limitations; Concept of production of vitamins and amino acids

**BAKERY & CONFECTIONARY TECHNOLOGY**

1. Introduction – Status of Bakery industry in India (02 hrs)

2. Raw Materials for Bakery Products (02 hrs)

Flour, sugar, shortening, yeast, salt and leavening agents as raw material for bakery products, their role and PFA specifications of these raw materials

3. Manufacturing of Bakery Products (8 hrs)

Different types of bread and preparation of bread using different methods, quality evaluation of bread, staling of bread

Different types of biscuits and preparation of biscuits using different methods, quality evaluation of biscuits

Different types of cakes and pastries, preparation of cakes and pastries using different methods, quality evaluation of cakes, different types of toppings

Preparation of other bakery products: rusks, crackers, buns, muffins, pizza and Kulcha

Types of additives used in bakery products

4. Confectionery Products (04 hrs)

Introduction, classification of confectionery products, confectionery ingredients like starch, fats, colours, flavours additives. Brief account of sweeteners like Gur, refined sugar, beet sugar, white sugar and liquid sweeteners like Molasses, corn syrup, high fructose syrup, maple syrup. Reaction of sugar like caramelization, hydrolysis and crystallization, sugar boiled, chocolate and Indian Confectionary

7. Layout, setting up of units and hygienic conditions required in bakery plant, operation and maintenance of bakery equipment (02 hrs)

### RECOMMENDED BOOKS

1. Industrial Microbiology by Prescott and Don, CBS Publishers and distributors Pvt. Ltd, New Delhi
2. Industrial Microbiology by Casida, Publishers, Inc., New York ... by Lester Earl Casida
3. Biotechnology: Food Fermentation by VK Joshi and Ashok Pandey, AVI Publish co., Westport
4. Biotechnology – Food Processing Application by SS Marwaha, Asiatech Publishers Inc., New Delhi
5. Bakery Engineering and Technology, Vol. I and II by Matz; CBS
6. Bakery Products Published by SIRI
7. Cereal Technology by Kent; CBS
8. Wheat Chemistry and Technology by Y Pomeranz
9. Basic Baking by SC Dubey
10. Practical Baking by William Sultan Vol. I and II
11. Practical Handbook of Bakery by US Wheat Associates

**FOOD FERMENTATION TECHNOLOGY, BAKERY &  
CONFECTIONARY TECHNOLOGY LAB**

**SUBJECT CODE : FTC410**

**LIST OF PRACTICALS**

1. Demonstration and study of fermenter and its functioning
2. Preparation of wine
3. Preparation of beer
4. Preparation of vinegar
5. Preparation of traditional fermented products Preparation of sauerkraut
6. Preparation of ginger ale
7. To determine alcohol content in alcoholic beverages
8. Visit to beverages and distillery (whiskey, Brandy, Rum)
9. Quality analysis of raw materials used in bakery and confectionery industry according to PFA standards
10. Preparation and evaluation of bakery and confectionery products:
  - Bread
  - Cakes
  - Biscuits
  - Buns
  - Pizza
  - Candy like ginger
  - Kulcha
11. Study and analysis of the production charts used for different products by bakery industries
12. Visits to bakery and confectionery industry



# PRINCIPLES OF FOOD ENGINEERING, HEALTH AND FUNCTIONAL FOODS

**SUBJECT CODE : FTC406**

**FULL MARKS : 100 (80+20)**

L T P

3 – 2

## RATIONALE

This subject is aimed to develop in the students the knowledge and skills related to various operations of process equipment used in food processing industry

## DETAILED CONTENTS

### Food Engineering

1. Introduction (04 hrs)
  - Units of measurement and their conversion
  - Physical properties like colour, size, shape, density, specific gravity, thousand grain weight/bulk density, porosity, Rheological properties of food materials and their importance
  - Thermal conductivity, specific heat, thermal diffusivity and other physical properties of foods
2. Materials and energy Balance (04 hrs)

Basic principles, total mass & component mass balance, system boundaries, material balance calculations, principle of energy balance, Heat, Enthalpy, calculations of specific heat.
3. Fluid Mechanics (4 hrs)

Manometers, Reynolds number, fluid flow characteristics, pumps – principles, types, and working of most common pumps used in food industry
4. Heat and Mass Transfer during food processing – Modes of heat transfer i.e. conduction, convection and radiation. Different heat exchangers. Principle of mass transfer, diffusion. (4 hrs)
5. Thermal Processing of Foods (4 hrs)

Selection, operation and periodical maintenance of equipments used in food industry viz. pasteurizer, autoclave, heat exchangers, evaporators, driers, boilers etc.

6. Psychrometry

(02 hrs)

Principle of psychrometry and its application

**Health & Functional Foods**

11. Introduction – definition, status and scope of health and functional foods in India (2 hrs)
2. Definition types and importance of nutraceuticals (2 hrs)
3. Types of health and functional foods and their properties (2 hrs)
4. Various food constituents responsible for functional effects (8 hrs)
  - Anti-carcinogenic, hypocholesterolemic and hypoglycemic foods
  - Anti-oxidants
  - Fortified and enriched foods
  - Biofedic, probiotic foods, prebiotics and symbiotic
  - High protein and high and low energy foods
  - Artificial sweetners
  - Geriatric foods
5. Importance fibre in health and prevention of diseases (2 hrs)
6. Fortification and enrichment, definition and importance, fortified foods-salts, atta and oil, enriched-juices and health drinks (2 hrs)
7. Organic and genetically modified foods (GM) in relation to health (2 hrs)

**RECOMMENDED BOOKS**

1. Post Harvest Technology of Cereal, Pulse and Oil Seeds by Chakraborty, AC, CBS Publishers, Delhi.
2. Unit Operations in Agriculture Processing by Singh and Sahay, Vikas Publishing House (P) Ltd, New Delhi
3. Fundamentals of Food Engineering by Brennen, AVI Publishing Co., Westport
4. Fundamentals of Food Processing Engineering by Romeo T Toledo, AVI Publishing Co., Westport
5. Agricultural Process Engineering by Henderson and Perry, John Wiley and Sons, Inc., New York
6. Transfer Processes and Unit Operation by CJ Geankoplis, McGraw-Hill Book Co., New York.

# PRINCIPLES OF FOOD ENGINEERING, HEALTH AND FUNCTIONAL FOODS LAB

SUBJECT CODE : FTC411

## LIST OF PRACTICALS

1. Determination of physical properties like size, shape, roundness, sphericity of the food products
2. Determination of angle of repose of grains
3. Study of thermal processing equipment
  - a) Pasteurizer
  - b) Heat Exchanger
  - c) Evaporator
  - d) Drier
4. Constructional and working details of different types of
  - a) Pumps for liquid transportation
  - b) Blower and fan for transportation for gases/air
5. Reading and interpretation of psychro-metric charts
6. Exercises related to material balance
7. Use of steam tables and their interpretation
8. Determination of thermal conductivity of a given food sample
9. Preparation of high fibre bread
10. Preparation of high fibre biscuits
11. Preparation of high fibre cake
12. Preparation of nutritious beverages
13. Preparation of functional foods for obese persons
14. Preparation of functional foods for aged persons
15. Preparation of hypocholesterolemic foods
16. Preparation of diets for anaemic patients
17. Preparation of low sodium foods
18. Preparation of malt based drink
19. Preparation of foods for under-weight persons
20. Preparation of high caloric diet for sportsmen
21. Preparation of high protein diet for sportsmen
22. Preparation of fortified atta



## Professional Practices-II

**Subject Code : 401**

### Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and their attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

### Objectives:

Student will be able to:

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Prepare a report on industrial visit, expert lecture

Sl. No.	Activity Heads	Activities	Suggested Hrs
1.	Acquire information from different sources	Topic related to the branch and current area of interest i.e. articles in internet on which research or review is undergoing may be decided for the students group. The group may be restricted to maximum 5 students. Literature survey from Internet , print media and nearby practices may be undertaken. Minimum of 10 to 15 papers may be suggested for reading to get an overview and idea of matters.	12
2.	Prepare notes for given topic	Making review or concept to be penned down in form of a article .( the article or review may be of 8 – 10 pages length in digital form of 12 font size in Times New Roman font)	4
3.	Present given topic in a seminar	A seminar or conference or work shop on branch related topic is to be decided and all students in group of 5-6 students may be asked to present their views.	4
4.	Interact with peers to share thoughts	A power point presentation of the article prepared in stage 2 may be presented before the classmates and faculty members.	4
5.	Prepare a report on industrial visit,expert	A topic on best practices and product / software development may be assigned to the student group. The group may be asked to prepare a survey, come to opinion making and list out the activities to develop the activities with SWOT analysis.	12