SYLLABUS FOR THE BATCH FROM YEAR 2025 TO 2026
FOR

Certificate in
Introduction to Food Processing Technology

(Credit Based Evaluation and Grading System)

Semester: I

EXAMINATIONS: 2025-2026

The Certificate Programme Offered:

- **Certificate Course in Introduction to Food Processing Technology (6 Months duration)**

Program Outcomes:

- **Fundamental Knowledge of Food Processing Technology** – Students will gain an understanding of the basic principles of food processing technology.
- **Enhanced Technical Skills** – The program focuses on introducing the students with the field of food science and technology and to provide them the basic understanding about various principles and techniques used in food processing industry. In addition, the course would also provide them an overview of processing of various food products.
- **Career Readiness & Employability** – The course will be helpful for prospective food processing entrepreneurs.

Name of the Department: Food Science and Technology

In collaboration with

Directorate of Open & Distance Learning and Online Studies

GURU NANAK DEV UNIVERSITY AMRITSAR

Certificate in INTRODUCTION TO FOOD PROCESSING TECHNOLOGY (SEMESTER SYSTEM)
Offered by Department of Food Science and Technology in Collaboration with Directorate of Open & Distance Learning and Online Studies, Guru Nanak Dev University Amritsar

Eligibility

- +2 in any stream or Equivalent Examinations.
- Any student Pursuing Bachelor Degree, Master Degree, M.Phil., Ph.D. from GNDU campus, affiliated or constituted colleges.

SEMESTER-I

Paper Code	Subject	Marks			Credits
		Internal Assessment	End Term	Total	
ODFPT101T	Introduction to Food Science and Technology	30	70	100	4
ODFPT102T	Basic Principles and Techniques of Food Processing	30	70	100	4
ODFPT103T	Processing of Food Products	30	70	100	4
ODFPT104P	Project	-	100	100	4
	Total Marks & Credits	**90**	**310**	**400**	**16**

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Subject Name: Introduction to Food Science and Technology
Subject Code: ODFPT101T
(Semester – I)

Time: 03 Hours **Max. Marks: 100 Marks**
Internal Assessment: 30 Marks
End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub- parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Introduction to Food Science, Food Technology, Food Adulteration, Food Fortification and Enrichment.

Classification of foods based on origin, functions, shelf life, pH, and processing.

Basic concept of Nutraceuticals and Functional Foods and their importance.

Section – B

Macro and micronutrients: Carbohydrates, Proteins, Fats, Vitamins, and Minerals - functions and sources.

Composition of various foods: Cereals, Pulses, Milk, Meat, Egg.

Antinutritional factors present in various foods.

Section – C

Food Spoilage: Definition, Physical, Chemical and Biological Spoilage of Foods.

Food Borne Diseases.

Importance of microorganisms in various food processing industries.

Section – D

Additives used in food processing: Colouring agents, flavouring agents, sweeteners, preservatives, anticaking agents, acidulants, emulsifiers, and antioxidants.

Basic concept of food hygiene and sanitation.

Introduction to FSSAI.

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Subject Name: Basic Principles and Techniques of Food Processing
Subject Code: ODFPT102T
(Semester – I)

Time: 03 Hours **Max. Marks: 100 Marks**
Internal Assessment: 30 Marks
End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub- parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Basic concepts: Units and their usage; Concepts of temperature, concentration and pressure; Basic principles of material balance; Basic principles of energy balance.
Heat transfer in food processing: Basic concepts and modes of heat transfer. Working principle and operation of equipment used for heat transfer in food industry such as steam-infusion heat exchanger, steam-injection heat exchanger, plate heat exchanger, tubular heat exchanger and scraped-surface heat exchanger. *Fluid flow in food processing:* Basic concepts and types of fluids. Working principle and operation of various types of pumps used in food industry: centrifugal pumps and positive displacement pumps.

Section – B

Cleaning, sorting and grading: Theory and equipment used in food industry. *Material Handling:* Theory and working of belt conveyors, screw conveyors, bucket elevators and pneumatic conveyors. *Size reduction and sieving:* Basic concepts and industrial uses. Theory and working of hammer mill, ball mill and disc- attrition mills.
Dehydration: Basic theory of drying and concept of moisture content representation. Working principle and operation of various types of dryers used in food industry such as bin dryer, cabinet or tray dryer, belt or conveyor dryer, fluidized bed dryer, kiln dryer, pneumatic dryer, spray dryer, trough dryer, tunnel dryer and freeze dryer. *Evaporation:* Basic theory of evaporation. Working principle and operation of various types of evaporators used in food industry such as pan evaporator, natural circulation evaporator, rising- film evaporator, falling-film evaporator, rising/falling-film evaporator, forced-circulation evaporator and agitated thin-film evaporator.

Section – C

Filtration: Basic theory. Working principle and operation of bed filters, plate-and-frame filter presses, leaf filters and continuous rotary filters. *Centrifugation:* Basic theory. Working principle and operation of tubular centrifuge and disc bowl centrifuge. *Refrigeration:* Basic theory and concept of mechanical vapour-compression refrigeration system. *Freezing:* Basic theory. Working principle and operation of various types of freezers used in food industry such as Indirect contact freezing systems: Plate freezers, Air-blast freezers and Freezers for liquid foods, and Direct contact freezing systems: Air-blast and immersion freezing systems.

Introduction to Preservation Techniques: Benefits of food preservation. Causes of food deterioration. Principles of food preservation. Preservation techniques like drying, freezing, elimination of oxygen, addition of carbondioxide, fermentation, addition of preservatives and antioxidants, hurdle technology, pasteurization, sterilization, irradiation, cooking, frying, microwave heating, blanching and novel technologies like cold plasma, pulsed electric field, ultrafiltration, high pressure processing.

Section - D

Food Packaging: Introduction to packaging, functions of a food package, designing of a package. *Packaging materials:* Classification, uses, advantages and limitations of paper, plastics, glass, metals, laminates. *Special packaging methods:* Vacuum packaging, aseptic packaging, retortable pouch technology.

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Subject Name: Processing of Food Products

Subject Code: ODFPT103T

(Semester – I)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub- parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
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Section – A

Fruits and Vegetable Products

1. Tomato products: Juice, puree, paste, soup, ketchup and sauces.
2. Canning of fruits and vegetables: Basic principle, Process of canning, Equipments and Specifications.
3. Frozen Fruits and vegetables: Slow and quick freezing, freezing process, freezers, thawing methods.

Section – B

Malted Food

1. Malting and brewing techniques, suitability of different cereals.
2. Quality evaluation of malt, special malts.
3. Waste management: spent grains, composition and uses.

Section – C

Cereals and their products

1. Types of cereals: Wheat, corn, rice, oats, millets.
2. Grain structure of cereals and their benefits.
3. Cereal products: breakfast cereals, cookies, muffins.

Section – D

Animal products

1. Nutritional value of egg. Preparation of egg pickle.
2. Nutritional value of chicken meat. Preparation of chicken soup.
3. Preparation of chicken *parantha*.

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Subject Name: Project
Subject Code:
ODFPT101P
(Semester – I)

Max. Marks: 100 Marks