

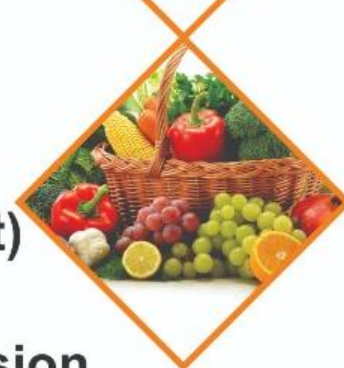


**National Vocational Qualification**  
**CURRICULUM OF FOOD TECHNOLOGY**

**Level 4**

**(Assistant Food Supervisor/Senior Lab Attendant)**

**National Vocational and Technical Training Commission**  
**Islamabad**



# National Vocational Qualification

## Curriculum of Food Technology Level 4



**National Vocational & Technical Training Commission,  
Islamabad**

### TABLE OF CONTENTS

SR.NO	CONTENTS	PAGES
<u>1. 4.</u>	<u>Introduction</u>	<u>14</u>

<u>2. 2.</u>	<u>Purpose of the training program</u>	<u>14</u>
<u>3. 3.</u>	<u>Overall objectives of training program</u>	<u>24</u>
<u>4.</u>	<u>Curriculum Validation Committee</u>	<u>3</u>
<u>5. 4.</u>	<u>Competencies to be gained after completion of course</u>	<u>42</u>
<u>6. 5.</u>	<u>Job opportunities available immediately and later in the future</u>	<u>42</u>
<u>7. 6.</u>	<u>Trainee entry level</u>	<u>42</u>
<u>8. 7.</u>	<u>Minimum qualification of trainer</u>	<u>42</u>
<u>9. 8.</u>	<u>Recommended trainer : trainee ratio</u>	<u>43</u>
<u>10.9.</u>	<u>Medium of instruction i.e. language of instruction</u>	<u>43</u>
<u>11.10.</u>	<u>Duration of course (total time, theory and practical)</u>	<u>53</u>
<u>12.11.</u>	<u>Summary - Overview of the curriculum</u>	<u>55</u>
<b>SEQUENCE OF CURRICULUM MODULES</b>		<b><u>6</u></b>
<u>0721</u> <u>01000000000</u>	<u>Apply Food Waste Management Techniques</u>	<u>867</u>
<u>0721</u> <u>02000000000</u>	<u>Perform Canning Process</u>	<u>1069</u>
<u>0721</u> <u>03000000000</u>	<u>Perform Pickling Process</u>	<u>1374</u>
<u>0721</u> <u>04000000000</u>	<u>Ensure Water Treatment in food industry</u>	<u>1573</u>
<u>0721</u> <u>05000000000</u>	<u>Perform Non-Carbonated Beverage Processing</u>	<u>1976</u>
<u>0721</u> <u>06000000000</u>	<u>Prepare Fermented Dairy products</u>	<u>2278</u>
<u>0721</u> <u>07000000000</u>	<u>Prepare Non-Fermented Dairy Products</u>	<u>2480</u>
<u>0721</u> <u>08000000000</u>	<u>Perform Egg Processing and Preservation</u>	<u>2984</u>
<u>0721</u> <u>09000000000</u>	<u>Perform Sea Food Processing</u>	<u>3286</u>
<u>0721</u> <u>10000000000</u>	<u>Prepare Snacks</u>	<u>3588</u>
<u>0000 00</u>	<u>Soft Skills</u>	
<b><u>List of Tools, Equipment and Consumables</u></b>		<b><u>38</u></b>



## **1. INTRODUCTION**

The agriculture sector is playing pivotal role to maintain the economy of the Pakistan where large number of individuals are directly or indirectly related to this sector to earn their livelihood. Pakistan has been bestowed with enormous climatic conditions conducive for producing multiple agricultural crops. However, much of the food produced is wasted due to negligence and lack of processing facilities. Alongside, there is always a huge need for food preservation and processing units capable of producing and ensuring availability of safe food for all necessary to maintain food security in the country. Hence, this course is specifically designed to develop basic to advanced skills and knowledge of the personnel related to Food Technology with special emphasis on requirements of the food industries with respect to safety and quality of the food products. The step by step training of the students in this course ensures polishing their skills to adapt and perform in the multidisciplinary environment of the food industries with variable food processing operations. The students are encouraged to implement their theoretical knowledge to wide range of food handling and processing environments such as raw material procurement, processing, storage, packaging and transportation while managing the quality and safety in the food systems. Furthermore, the students are introduced with new skills in a stepwise manner to increase their troubleshooting competencies in changing food operations. Notably, students are stimulated to polish their entrepreneurial skills and explore new horizons of the food processing industry.

To improve the quality and relevancy of this training program, National Vocational & Technical Training Commission via Qualification Development Committee (QDC) developed National Competency Standards Level 5 for Food Technology. The learning outcomes through this curriculum provide enough grounds to enrich the food industry with demand-driven trained personnel in line with the latest industrial needs. Furthermore, this curriculum can be implemented in different sectorial pathways with flexibility in both public and private sector institutes.

## **2. PURPOSE OF THE TRAINING PROGRAMME**

The purpose of this qualification is to give the trainee a thorough understanding of Food Technology in the industry with effective quality control and safety of the food products. Food Technology operations are diversified and continuously subject to various changes.

Therefore, it is important to emphasize on a multidisciplinary approach to meet the requirements of the industry and cope the encountered challenges in the food sector. Upon successful completion of this course the trainees will be aware of:

- The core elements of food processing and preservation techniques
- The chemistry underlying the properties and reactions of various food components
- The principles behind analytical techniques associated with food
- The laboratory techniques common to basic and applied food chemistry
- The basic principles and practices of hygiene and sanitation in food processing operations
- Applying the principles of food science to assure the quality and safety of food products.
- Waste management in food industries
- Providing supervision and working effectively with others in a variety of situations and dealing with individual and/or group conflict.

### **3. Overall objectives of training course**

The primary objective of this training program is to provide the trainees with up-to-date knowledge and skills required by the food sector in a comprehensive way to cope the challenges of the food industries. After qualifying the course at different levels (Level 2 – 5), the students will be able to get job in the food industries and able to perform as entrepreneurs. The contents of the course are specifically designed in such a way that it covers all the major food sectors of Pakistan.

The overall objectives of developing this qualification are to:

- Improve the overall quality of training delivery and setting national benchmarks for training of Food Technology (Level 5) in the country
- Provide flexible and progressive learning opportunity for trainees to receive relevant and up-to-date skills of food industry
- Provide basis for competency-based assessment which is recognized and accepted by employers in modern days
- Establish a standardized and sustainable training in consultation with the food industry.

#### **4. Curriculum Validation Committee**

The following members participated in the qualifications validation meeting from February 7-11, 2022 at Pakistan Industrial Technical Assistance Center (PITAC), Lahore:

<b><u>Sr.</u></b>	<b><u>Name</u></b>	<b><u>Designation</u></b>
<b><u>1.</u></b>	<u>Mr. Muhammad Aasim</u>	<u>Convener/Assistant Director, NAVTTC Coordinator</u>
<b><u>2.</u></b>	<u>Mr. Muhammad Nasir Khan</u>	<u>DACUM Facilitator, Ex-Deputy Director, SS&amp;C Wing, NAVTTC</u>
<b><u>3.</u></b>	<u>Mr. Naeem-ur-Rehman Zafar</u>	<u>Deputy Manager Technical Application, AB Mauri Pakistan Pvt. Ltd. (Industry)</u>
<b><u>4.</u></b>	<u>Dr. Shinawar Waseem Ali</u>	<u>Ex-Quality Assurance Officer K&amp;N Pakistan</u> <u>Associate Professor, Institute of Agricultural Sciences, University of the Punjab, Lahore</u>
<b><u>5.</u></b>	<u>Mr. Muhammad Ahmad</u>	<u>Manager Projects LabOnline Bizware (Private) Limited (Industry)</u>
<b><u>6.</u></b>	<u>Mr. Mubeen Arshad Awan</u>	<u>Quality Assurance Head, YUM Group (Industry)</u> <u>Former Director PFA</u>
<b><u>7.</u></b>	<u>Mr. Hafiz Rehan Nadeem</u>	<u>Secretary General (NAFS), National Alliance for Safe Food, Pakistan</u>
<b><u>8.</u></b>	<u>Dr. Muhammad Ajmal</u>	<u>Representative P-TEVTA</u> <u>HOD, Food Technology, Govt. College of Technology, Sahiwal</u>
<b><u>9.</u></b>	<u>Dr. Tabussam Tufail</u>	<u>Assistant Professor, University of Lahore</u>
<b><u>10.</u></b>	<u>Dr. Iahisham-Ul-Haq</u>	<u>Assistant Professor, Kauser Abdulla Malik School of Life Science, Forman Christian College (A Chartered University), Lahore</u>
<b><u>11.</u></b>	<u>Mr. Muhammad Abdul Aziz</u>	<u>Ex-Manager, Munchies Food, Islamabad</u> <u>Ex-Manager, Dominos, Islamabad</u>
<b><u>12.</u></b>	<u>Dr. Sumaira Magsood</u>	<u>Assistant Professor Entomology, Institute of Agricultural Sciences, University of the Punjab, Lahore</u>
<b><u>13.</u></b>	<u>Ms. Samina Kulsoom</u>	<u>Representative S-TEVTA</u> <u>GCT Girls, Karimabad, Karachi</u>
<b><u>14.</u></b>	<u>Mr. Engr. Kifayatullah Khan</u>	<u>Representative B-TEVTA</u> <u>HOD Food Technology, Govt. Polytechnic Institute, Khanozia</u>
<b><u>15.</u></b>	<u>Mr. Shaukat Ali Rana</u>	<u>Representative PBTE</u> <u>Deputy Controller Examination</u>



## 5. Competencies to be gained after completion of course

After completing this course, the students will be capable of performing different food processing operations decently in the food industries. Furthermore, this skilled training program enables the students to develop multispectral competencies such as creative thinking, problem solving, research skills, personal and group management, presentation and communication skills, technical and professional negotiations related to food processing operations. The below listed competencies imprinted by this training program are quite prominent to the students' profile to enhance their employability in their career in food sector:

- Knowledge and concepts of processing operations in food industry
- Creative thinking and troubleshooting skills in food manufacturing
- Potential to translate theoretical knowledge into practice
- Identify and explore potential areas of opportunities in food sector
- Develop strategies to maintain quality and safety of food products
- Time management, working in teams and conflict handling among co-workers
- Safe and secure use of workplace tools, techniques and materials at worksites
- Digital documentation and effective communication skills
- Working in commercial setups and meeting the timelines

## 6. Job opportunities available immediately and in the future

—The successful pass outs of this course may avail entrepreneurial opportunities and/or fetch job/employment in food sectors as

- ~~— Skilled Worker/ Junior Lab Attendant (Level-II)~~
- ~~— Line Supervisor/ Lab Attendant (Level-III)~~
- Assistant Food Supervisor/ Sr. Lab Attendant (Level-IV)
- ~~— Food Supervisor/ Lab Technician/ Operator (Level-V)~~

## 7. Trainee Entry Level:

- Matric science or equivalent, ~~w-preferably F.Sc~~ith level III qualified.

## 8. Minimum Qualification of Trainer

- ~~2-5 years of professional experience in food industry after~~ BS Food Science & Technology ~~or/~~ DAE ~~(Food Technology with 2 years of relevant experience)~~

## 9. Recommended trainer: trainee ratio



- The recommended trainer and trainee ratio is 1:24 per class

#### 10. Medium of Instruction:

- Urdu, English or Local/Regional Language

#### 11. Duration of Course (Total time, theory & practical) [20:80]

<u>Module #</u>	<u>Title</u>	<u>Theory Total (Hours)</u>	<u>Practical Total (Hours)</u>	<u>Total (Hours)</u>	<u>Credit hours</u>
<u>1.</u>	<u>Apply food Waste Management Techniques</u>	<u>10</u>	<u>50</u>	<u>60</u>	<u>6</u>
<u>2.</u>	<u>Perform Canning Process</u>	<u>20</u>	<u>90</u>	<u>110</u>	<u>11</u>
<u>3.</u>	<u>Perform Pickling Process</u>	<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
<u>4.</u>	<u>Ensure Water Treatment in food industry</u>	<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
<u>5.</u>	<u>Perform Non-Carbonated Beverage Processing</u>	<u>30</u>	<u>120</u>	<u>150</u>	<u>15</u>
<u>6.</u>	<u>Prepare Fermented Dairy products</u>	<u>30</u>	<u>120</u>	<u>150</u>	<u>15</u>
<u>7.</u>	<u>Prepare Non-Fermented Dairy Products</u>	<u>30</u>	<u>90</u>	<u>120</u>	<u>12</u>
<u>8.</u>	<u>Perform Egg Processing and Preservation</u>	<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
<u>9.</u>	<u>Perform Sea Food Processing</u>	<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
<u>10.</u>	<u>Prepare snacks</u>	<u>20</u>	<u>90</u>	<u>110</u>	<u>11</u>
<u>11.</u>	<u>Soft Skills</u>	<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
<u>Total</u>		<u>240</u>	<u>960</u>	<u>1200</u>	<u>120</u>

#### Qualification Validation Committee

The following members participated in the qualifications validation meeting from February 07, 2022 to February 11, 2022 in Lahore:

<u>Sr.</u>	<u>Name</u>	<u>Designation</u>
<u>—</u>	<u>Mr. Muhammad Aasim</u>	<u>Convener/Assistant Director, NAVTTC Coordinator</u>

—	<u>Mr. Muhammad Nasir Khan</u>	<u>DACUM Facilitator, Ex-Deputy Director, SS&amp;C Wing, NAVTTC</u>
—	<u>Mr. Naeem-ur Rehman Zafar</u>	<u>Deputy Manager Technical Application, AB Mauri Pakistan Pvt. Ltd. (Industry)</u>
—	<u>Dr. Shinawar Waseem Ali</u>	<u>Ex-Quality Assurance Officer K&amp;N Pakistan</u> <u>Associate Professor, Institute of Agricultural Sciences, University of the Punjab, Lahore</u>
—	<u>Mr. Muhammad Ahmed</u>	<u>Technical Auditor Halal Food (Industry)</u>
—	<u>Mr. Mubeen Arshad Awan</u>	<u>Quality Assurance Head, YUM Group (Industry)</u> <u>Former Director PFA</u>
—	<u>Mr. Hafiz Rehan Nadeem</u>	<u>Secretary General (NAFS), National Alliance for Safe Food, Pakistan</u>
—	<u>Dr. Muhammad Ajmal</u>	<u>Representative P-TEVTA</u> <u>HOD, Food Technology, Govt. College of Technology, Sahiwal</u>
—	<u>Dr. Tabussam Tufail</u>	<u>Assistant Professor, University of Lahore</u>
—	<u>Dr. Ihtisham Ul-Haq</u>	<u>Assistant Professor, Kauser Abdulla Malik School of Life Science, Forman Christian College (A Chartered University), Lahore</u>
—	<u>Mr. Muhammad Abdul Aziz</u>	<u>Ex-Manager, Munchies Food, Islamabad</u> <u>Ex-Manager, Dominos, Islamabad</u>
—	<u>Dr. Sumaira Maqsood</u>	<u>Assistant Professor Entomology, Institute of Agricultural Sciences, University of the Punjab, Lahore</u>
—	<u>Ms. Samina Jafri</u>	<u>Representative S-TEVTA</u> <u>GCT Girls, Karimabad, Karachi</u>
—	<u>Mr. Engr. Kifayatullah Khan</u>	<u>Representative B-TEVTA</u> <u>HOD Food Technology, Govt. Polytechnic Institute, Khanozia</u>
—	<u>Mr. Shaukat Ali Rana</u>	<u>Representative PBTE</u> <u>Deputy Controller Examination</u>

<u>LEVEL — 4</u>						
—	<u>Apply food Waste Management Techniques</u>	<u>Assistant Food Supervisor / Sr. Lab</u>	<u>12</u>	<u>48</u>	<u>60</u>	<u>6</u>

—	<u>Perform Canning Process</u>	<u>Attendant / Junior Operator / Junior Technician</u>	<u>22</u>	<u>90</u>	<u>110</u>	<u>11</u>
—	<u>Perform Pickling Process</u>		<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
—	<u>Ensure Water Treatment in food industry</u>		<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
—	<u>Perform Non-Carbonated Beverage Processing</u>		<u>30</u>	<u>120</u>	<u>150</u>	<u>15</u>
—	<u>Prepare Fermented Dairy products</u>		<u>30</u>	<u>120</u>	<u>150</u>	<u>15</u>
—	<u>Prepare Non-Fermented Dairy Products</u>		<u>30</u>	<u>90</u>	<u>120</u>	<u>12</u>
—	<u>Perform Egg Processing and Preservation</u>		<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
—	<u>Perform Sea Food Processing</u>		<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
—	<u>Prepare snacks</u>		<u>20</u>	<u>90</u>	<u>110</u>	<u>11</u>
—	<u>Soft Skills</u>		<u>20</u>	<u>80</u>	<u>100</u>	<u>10</u>
<u>TOTAL</u>			<u>240</u>	<u>960</u>	<u>1200</u>	<u>120</u>

## **12. Summary of Competency Standards:**

The proposed curriculum is composed of 11 modules that will be covered in 1200 hrs. It is proposed that the course may be delivered in one (01) year period. The distribution of contact hours (practical & theory) is given below:

➤ **Theory: (20%) Practical (80%)**

➤ **Theory: 240 hours**

➤ **Practical: 960 hours**

#### **SUMMARY – OVERVIEW OF THE CURRICULUM**

# ~~LEVEL-4~~

<u>Module Title</u>	<u>Learning Units</u>	<u>Theory Days/hours</u>	<u>Workplace Days/hours</u>	<u>Timeframe of modules</u>
<b><u>Module 01.</u></b> <b><u>Apply Food Waste Management Techniques</u></b>	<b><u>LU1.</u></b> Identify the process wastes <b><u>LU2.</u></b> Apply the standard operating procedure of waste disposal <b><u>LU3.</u></b> Analyze environmental pollution due to food waste <b><u>LU4.</u></b> Apply basic mathematics to calculate the impact of loss	<u>10</u>	<u>50</u>	<u>60</u>
<b><u>Module 02.</u></b> <b><u>Perform Canning process</u></b>	<b><u>LU1.</u></b> Perform preparatory operations <b><u>LU2.</u></b> Prepare syrup/brine for fruits and vegetables <b><u>LU3.</u></b> Perform Fill and close can seams <b><u>LU4.</u></b> Perform and operate the retort process	<u>20</u>	<u>90</u>	<u>110</u>
<b><u>Module 03.</u></b> <b><u>Perform Pickling Process</u></b>	<b><u>LU1.</u></b> Prepare raw materials for pickling <b><u>LU2.</u></b> Mix ingredients <b><u>LU3.</u></b> Packaging of pickles	<u>20</u>	<u>80</u>	<u>100</u>
<b><u>Module 04.</u></b> <b><u>Ensure Water Treatment in Food Industry</u></b>	<b><u>LU1.</u></b> Ensure raw and final water analysis <b><u>LU2.</u></b> Ensure pre filtration <b><u>LU3.</u></b> Ensure satisfactory working of RO (reverse osmosis) unit <b><u>LU4.</u></b> Ensure satisfactory working of UV <b><u>LU5.</u></b> Ensure ultrafiltration (UF) <b><u>LU6.</u></b> Perform activated carbon filtration <b><u>LU7.</u></b> Ensure satisfactory working of Ozonator <b><u>LU8.</u></b> Perform water testing	<u>20</u>	<u>80</u>	<u>100</u>
<b><u>Module 05.</u></b> <b><u>Perform Non-Carbonated Beverage Processing</u></b>	<b><u>LU1.</u></b> Apply standard formulation procedure <b><u>LU2.</u></b> Apply mixing process	<u>30</u>	<u>120</u>	<u>150</u>

	<u>LU3. Ensure Pasteurization and homogenization of for non-carbonated drinks</u> <u>LU4. Filling of beverages</u>			
<u>Module 06.</u> <u>Perform Fermented Dairy Products</u>	<u>LU1. Prepare the fermentation process for operation</u> <u>LU2. Operate and monitor the fermentation process</u> <u>LU3. Shut down fermentation process</u> <u>LU4. Recording information</u>	<u>30</u>	<u>120</u>	<u>150</u>
<u>Module 07.</u> <u>Perform Non-Fermented Dairy Products</u>	<u>LU1. Receiving milk</u> <u>LU2. Perform pasteurization</u> <u>LU3. Perform fat separation as per product requirement</u> <u>LU4. Perform milk standardization</u> <u>LU5. Pack pasteurized milk</u> <u>LU6. Operate milk evaporator</u> <u>LU7. Prepare UHT milk</u> <u>LU8. Pack UHT milk</u> <u>LU9. Prepare milk powder</u>	<u>30</u>	<u>90</u>	<u>120</u>
<u>Module 08.</u> <u>Perform Egg Processing and Preservation</u>	<u>LU1. Receive eggs</u> <u>LU2. Grade and apply coating of eggs</u> <u>LU3. Store eggs</u> <u>LU4. Produce egg powder</u>	<u>20</u>	<u>80</u>	<u>100</u>
<u>Module 09.</u> <u>Perform Sea Food Processing</u>	<u>LU1. Receive the raw material</u> <u>LU2. Perform preparatory operations</u> <u>LU3. Perform cutting and filleting</u> <u>LU4. Pack and store fish cuts</u>	<u>20</u>	<u>80</u>	<u>100</u>
<u>Module 10.</u> <u>Prepare Snacks</u>	<u>LU1. Receive &amp; Prepare ingredients</u> <u>LU2. Mix ingredients</u> <u>LU3. Perform Moulding</u> <u>LU4. Perform Frying/Baking</u> <u>LU5. Ensure cooling</u> <u>LU6. Pack and store snack products</u>	<u>20</u>	<u>90</u>	<u>110</u>

## Module 16: Apply Food Waste Management Techniques

**Objective:** After completing this module, the learner will be able to demonstrate the understanding of the basic applications of food waste management. Trainee will be able to perform the activities associated with waste management techniques being applied in the food industry to reduce environmental pollution.

Duration:	Total hours	60	Practical	50	Theory	10
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
LU1. Identify the process wastes	<ul style="list-style-type: none"> <li><del>P1.</del> Manage waste and by-products</li> <li><del>P2.</del> Categorize different types of food waste</li> </ul>	<ul style="list-style-type: none"> <li>Define Food Waste</li> <li>Define Enlist types of waste e.g., Solid Waste, Liquid Waste,</li> <li>Enlist by-products of processes involved in food industry.</li> <li>Demonstrate food waste Describe types of pollution. Enlist the impact of Pollution on environment.</li> <li>disposal Techniques. Describe about Food waste disposal techniques.</li> </ul>	02-03 hours Theory  409 hours Practical  Total:12 hours	Cylinders, beakers, test tubes,	Class Room and workplace
LU2. Apply the standard operating procedure of	<ul style="list-style-type: none"> <li><del>P1.</del> Check characteristics of food waste</li> <li><del>P2.</del> Perform Ensure different analysis of food waste</li> </ul>	<ul style="list-style-type: none"> <li>Define Explain the characteristics of food waste.</li> <li>Enlist the standards of Environmental Safety by EPA</li> </ul>	04-07 hours Theory  24-21 hours Practical	Spectrophotometer, refractometer, pH meter, TDS Meter,	Class Room and workplace



waste disposal	<ul style="list-style-type: none"> <li><del>P3.</del> <u>Apply-Implement</u> waste disposal according to SOP's and environmental standards</li> </ul>	<p><u>(Environmental Protection Agency).</u></p> <ul style="list-style-type: none"> <li><u>Describe Demonstrate</u> SOP's related to <u>food</u> waste disposal.</li> <li><del>Enlist the standards of Environmental Safety by EPA (Environmental Protection Agency).</del></li> <li><del>Analyze effluents of food processing industries.</del></li> <li><del>Explain different strategies to reduce wastes of food industry</del></li> <li><del>Analyze Food waste in terms of acidity, pH, sedimentation, TDS and TSS etc.</del></li> </ul>	Total:28 hours	titration apparatus	
LU3. Analyze environmental pollution due to food waste	<ul style="list-style-type: none"> <li><del>P1.</del> <u>Apply</u> analytical techniques to examine sources of</li> <li><del>environmental pollution</del></li> <li><del>Implement different steps to reduce environmental Pollution</del></li> </ul>	<ul style="list-style-type: none"> <li><del>Understand-Explain the Concept of</del> Cross-Contamination, its sources and control.</li> <li>Define the BOD/COD (Biological Oxygen Demand/Chemical Oxygen Demand).</li> <li>Describe the sources of environmental pollution.</li> <li><del>Define the concept of industrial plant layout</del></li> </ul>	<p><del>02-03</del> hours Theory</p> <p><del>409</del> hours Practical</p> <p>Total: 12 hours</p>	BOD & COD apparatus	Class Room and workplace

	<p><del>— P2. Execute different steps to reduce environmental Pollution</del></p> <p>—</p> <p>•</p>	<ul style="list-style-type: none"> <li>• <del>Enlist</del> Demonstrate the steps to reduce environmental pollution</li> </ul>			
<b>LU4. Apply basic mathematics to calculate the impact of loss</b>	<ul style="list-style-type: none"> <li>• <del>P1.</del> Calculate the waste percentage</li> <li>• <del>P2.</del> Interpret the results</li> </ul>	<ul style="list-style-type: none"> <li>• Describe actual and theoretical yields.</li> <li>• Explain and calculate processing line losses</li> <li>• <del>Define the waste percentage</del></li> <li>• Process data in graphical forms (pie charts, bar charts, line charts)</li> <li>• Interpret production and waste data.</li> </ul>	<p>02 hours Theory</p> <p>06 hours Practical</p> <p>Total:8 hours</p>	<p>Computers, calculators, graph charts, printers, stationary</p>	<p>Class Room and workplace</p>

## Module 172: Perform Canning Process

**Objective:** After completing this module, the learner will be able to perform preparatory operations for canning, prepare syrups/brines and perform filling & closing can seam. The learner will have knowledge and skills required to operate the retort for fruits, vegetables, meat and fish. The trainees will be competent to can fruits and vegetables as per specifications.

Duration:	Total hours	110	Practical	90	Theory	20
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
<b>LU1. Perform preparatory operations</b>	<ul style="list-style-type: none"> <li>• <del>P1:</del> Perform blanching as per set specifications.</li> <li>• <del>P2:</del> Operate peeler.</li> <li>• <del>P3:</del> Operate de-stoner.</li> <li>• <del>P4:</del> Perform Cutting, Slicing, Dicing, Shredding, Pulping, Crushing etc.</li> <li>• <del>P5:</del> Perform Mixing according to product requirement</li> </ul>	<ul style="list-style-type: none"> <li>• Define Blanching process</li> <li>• <del>Describe the peeling methods of fruits &amp; vegetables i.e., abrasive peeling, lye peeling</del></li> <li>• <del>Describe the operation of De-stoner</del></li> <li>• Describe the mixing process involved in food preparation (wet &amp; dry mixing of ingredients)</li> <li>• Explain the types of cleaning for raw material after receiving e.g. washing, aspiration. WPRW</li> </ul>	06 hours Theory  20 hours Practical  Total:26 hours	Juicer, crusher, slicer, dicer, peelers, cutting boards, de-stoner, pulpers, blenders, knives, choppers, blanchers, buckets, baskets, S.S bowls	Class Room and workplace

		<p>(Wash, Peel &amp; Re-Wash).</p> <ul style="list-style-type: none"> <li>• Enlist the types of color coded chopping boards along with food categories.</li> <li>• <a href="#">Demonstrate peeling methods used in fruits &amp; vegetables</a></li> </ul>			
<b>LU2. Prepare syrup/brine for fruits and vegetable</b>	<p><b>P1:•</b> Perform Syruping for fruits.</p> <p><b>P2:•</b> Perform brining for vegetables</p> <p><b>P3:•</b> Check quality parameters (Brix, viscosity, acidity, sensory evaluation)</p>	<ul style="list-style-type: none"> <li>• Define syrup and brine.</li> <li>• Describe the role of brining.</li> <li>• Define Brix.</li> <li>• Define viscosity of liquids and its importance in syrup making.</li> <li>• Elaborate the purpose of Salometer.</li> <li>• <a href="#">Define Sensory Evaluation</a></li> <li>• <a href="#">Demonstrate the working of Refractometer.</a></li> </ul>	<p>046 hours Theory</p> <p>20-18 hours Practical</p> <p>Total: 24 hours</p>	<p>Refractometer, Salometer, hydrometer, <a href="#">pH meter</a>, viscometer</p> <p><a href="#">S.S Bowls (Sugar, Salt and Water).</a></p> <p><a href="#">Performa for Sensory Evaluation</a></p>	<p>Class Room and workpl ace</p>
<b>LU3. Perform Fill and close can seams</b>	<p><b>P1:•</b> Perform <a href="#">to start the</a> filling process according to company procedures</p> <p><b>P2:•</b> <a href="#">Check-Ensure</a> filled and closed containers meet specification</p>	<ul style="list-style-type: none"> <li>• Define Hermetic seal.</li> <li>• Differentiate between Sceptic &amp; Aseptic Filling</li> <li>• Describe role of headspace</li> </ul>	<p>046 hours Theory</p> <p>20-18 hours Practical</p>	<p>Fillers, <a href="#">_sealing</a> machine, seamers, lid applicator, glass jars, metal cans-,</p>	<p>Class Room and workpl ace</p>

	<p><del>P3</del>:-● Check cans leakage</p> <p><del>P4</del>:-● Operate filler and seamer machine</p> <p><del>P5</del>:-● Record workplace information in the appropriate format</p>	<ul style="list-style-type: none"> <li>• Explain the stages of filling and closing process</li> <li>• <del>Define</del>—<u>Demonstrate</u> exhausting/vacuuming process</li> <li>• Describe the merits of adding syrups and brines in canning process.</li> </ul>	Total:24 hours		
<b>LU4. Perform and operate the retort process</b>	<ul style="list-style-type: none"> <li>• Prepare the retort <del>process</del> for the operation to meet production requirements</li> <li>• Check materials available to meet production requirements</li> <li>• Check services ready for operation</li> <li>• Perform the retort process according to company procedures</li> <li>• Check retorted product meets the specification</li> <li>• Identify <del>out-of-non-conforming specification</del> product, process and equipment <del>performance</del></li> <li>• Collect, treat and dispose-off waste according to <del>company procedures</del><u>SOPs</u></li> </ul>	<ul style="list-style-type: none"> <li>• Define sterilization.</li> <li>• <del>Explain retort process</del></li> <li>• <u>Describe the canning process</u></li> <li>• Enlist the types of retorts.</li> <li>• Describe role of syrups and brines in heat dissipation</li> <li>• <del>Describe the holding times and temperatures during retort</del></li> <li>• Describe waste handling requirements and procedures.</li> <li>• <del>State the safety measures to run retort e.g., covering vents, checking safety valves, gauge reading etc.,</del></li> </ul>	<p>069 hours Theory</p> <p><del>30-27</del> hours Practical</p> <p>Total:36 hours</p>	Retort with complete accessories, can opener, PPE, first aid kit	Class Room and workplace

		<ul style="list-style-type: none"> <li>• Describe the quality check points of end product.</li> <li>• <a href="#">Demonstrate retort process</a></li> </ul>			
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## Module 348: Perform Pickling Process

**Objective:** After completing this module, the learner will be capable to apply skills and knowledge to prepare raw materials for pickling process of fruits & vegetables and produce fruit and vegetable pickles. The trainees will be able to enhance skills related to mixing and packaging of pickles.

Duration:	Total hours	100	Practical	80	Theory	20
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
<b>LU1. Prepare raw materials for pickling</b>	<ul style="list-style-type: none"> <li>Inspect raw materials for use in production to meet specifications</li> <li>Perform sorting, sizing and grading machines to meet specifications</li> <li>Operate washing, cleaning, peeling, de-stoning units</li> <li><del>Operate conveying equipment/systems used to transfer materials to required locations</del></li> <li><del>Operate</del>Ensure blanching process/conditions (time, temperature, etc.)</li> <li>Maintain storage requirements of semi-processed products</li> </ul>	<ul style="list-style-type: none"> <li>Define <del>food preservation and role of FATTOM (Food, Acidity, Time, Temperature, Oxygen, Moisture).</del>Food pickling</li> <li>Define sun-drying process for fruits and vegetables.</li> <li><del>Describe</del> Demonstrate blanching and its role in color fixation.</li> <li><del>Enlist the steps of</del> pickling process</li> </ul>	<p>069 hours Theory</p> <p>30-27 hours Practical</p> <p>Total:36 hours</p>	<p>crusher, slicer, dicer, peelers, cutting boards, de-stoner, pulpers, blenders, knives, choppers, blanchers, buckets, baskets, S.S bowls</p> <p><a href="#">Fruits and vegetables</a></p>	Class Room and workplace



		<ul style="list-style-type: none"> <li>• <del>Describe the types of cleaning for raw material after receiving e.g. washing, aspiration. WPRW (Wash, Peel &amp; Re-Wash).</del></li> <li>• <del>Enlist</del> <u>Demonstrate</u> the types of color coded chopping boards along with food categories.</li> </ul>			
<b>LU2. Mix ingredients</b>	<ul style="list-style-type: none"> <li>• Prepare mixtures of vegetables/fruits and additives according to product specification</li> <li>• Store product at defined conditions for aging</li> </ul>	<ul style="list-style-type: none"> <li>• Define food additives used in pickling process.</li> <li>• Define aging and seasoning of pickles.</li> <li>• Describe the role of food additives and preservatives (Salt, vinegar, oils, spices, acids etc.,)</li> <li>• <del>Differentiate between Sorting and grading</del></li> <li>• <del>Describe</del> <u>monstrate the</u> mixing process</li> </ul>	<p><del>08-09</del> hours Theory</p> <p><del>30-29</del> hours Practical</p> <p>Total:38 hours</p>	Glass Jars, Buckets, Knives, Spoons, Mixers, <u>Chemical Additives</u>	Class Room and workplace

		<p>involved in pickling (wet &amp; dry mixing of ingredients)</p> <ul style="list-style-type: none"> <li>• <del>State the quality characteristics (doneness) of end product in pickling process.</del></li> </ul>			
<b>LU3. Packaging of pickles</b>	<ul style="list-style-type: none"> <li>• Select appropriate packaging material</li> <li>• Operate filling and sealing machine</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Define Packaging</u></li> <li>• Explain <del>about the</del> packaging materials used for pickles.</li> <li>• <del>Describe waste handling, its requirements and procedures</del></li> <li>• <u>Describe</u> Common causes of variation in- quality and corrective action required during pickling processes</li> <li>• <u>Demonstrate packaging of pickles</u></li> </ul>	<p>06 hours Theory</p> <p>20 hours Practical</p> <p>Total:26 hours</p>	<p>Packaging machine, Sealing machine, labeling machine, <u>Glass and plastic Jars</u></p>	<p>Class Room and workplace</p>

## Module 4-19: Ensure Water Treatment in Food Industry

**Objective:** After completing this module, the learner will be able to perform water filtration through Reverse Osmosis, Ultraviolet, Ultrafiltration, Ozonation and check quality of water filtration systems. The learner will understand the principles of water treatment for food industry and learn about different water treatment processes.

<b>Duration:</b>	<b>Total hours</b>	<b>100</b>	<b>Practical</b>	<b>80</b>	<b>Theory</b>	<b>20</b>
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
<b>LU1. Ensure raw and final water analysis</b>	<ul style="list-style-type: none"> <li>Ensure availability of water testing chemicals and equipment <del>are</del> <u>available</u></li> <li>Check the physical, chemical and microbiological analysis of raw and final water as per the defined frequency</li> <li>—Check all chemicals and equipment are in good working conditions</li> <li><del>Read specifications for raw and final water standards</del></li> </ul>	<ul style="list-style-type: none"> <li><u>Define potable water</u></li> <li>Define Total Dissolved Solids. (TDS)</li> <li>Describe the factors affecting water quality</li> <li>Define Total Plate Count (TPC).</li> <li>Explain Water contamination.</li> <li><u>Demonstrate methods of water analysis.</u></li> <li><u>Differentiate</u> between the characteristics of Hard water and Soft water</li> </ul>	04 hours Theory  10 hours Practical  Total hours 14	Binocular Microscopes, Test tubes, colony counter, laminar flow hood, autoclave, petri plates, TDS meter , pH meter, <u>Media and Culture</u>	Class Room and workplace

		•			
<b>LU2. Ensure pre filtration</b>	<ul style="list-style-type: none"> <li>Operate pre filter (sand, dirt, silt and other sediments)</li> <li>Check carbon filter</li> <li>Check water odor</li> </ul>	<ul style="list-style-type: none"> <li>Define sedimentation.</li> <li><del>Describe role of</del> <u>Demonstrate working of</u> Carbon Filter in water treatment.</li> <li>Define Deodorization</li> <li>Explain different types of water filters.</li> </ul>	023 hours Theory  409 hours Practical  Total hours 12	Sand filter, carbon filter, deodorizer	Class Room and workplace
<b>LU3. Ensure satisfactory working of RO (reverse osmosis) unit</b>	<ul style="list-style-type: none"> <li>Check RO membrane</li> <li>Ensure cleaning of membrane</li> <li>Change membrane <del>after certain running hours</del> <u>as per schedule</u></li> </ul>	<ul style="list-style-type: none"> <li>Define Reverse Osmosis (RO).</li> <li>Describe the principle of Reverse Osmosis</li> <li>Enlist the parts of RO plant</li> <li><del>Describe</del> <u>Demonstrate the</u> process of membrane replacement.</li> </ul>	023 hours Theory  409 hours Practical  Total hours 12	RO unit, RO membranes	Class Room and workplace
<b>LU4. Ensure satisfactory working of <u>Ultra Violet (UV)</u>UV</b>	<ul style="list-style-type: none"> <li>Check <u>and operate</u> Ultra Violet lamp</li> <li><del>Operate UV lamp</del></li> </ul>	<ul style="list-style-type: none"> <li>Define Ultraviolet <del>disinfection</del> <u>filtration</u>.</li> <li>Describe the <del>principle role</del> <u>of UV light Filtration</u></li> </ul>	023 hours Theory  409 hours Practical	UV filters, UV lamp,	Class Room and workplace

	<ul style="list-style-type: none"> <li>Ensure the lamp is in <del>well</del> working condition</li> <li>Analyze water sample before and after UV</li> <li><del>Replace</del> <u>Ensure replacement of</u> lamp after its life</li> </ul>	<ul style="list-style-type: none"> <li><del>Mention</del> <u>Explain</u> the effect of UV light on microbes</li> <li><del>State the sources of UV light.</del></li> </ul>	Practical Total hours 12		
<b>LU5. Ensure ultrafiltration (UF)</b>	<p><del>P1:-</del> <u>•</u> Check UF membrane</p> <p><del>P2:-</del> <u>•</u> Change UF <u>membrane</u> as per standard requirement</p>	<ul style="list-style-type: none"> <li>Define Ultrafiltration.</li> <li><u>• Define Contaminants</u></li> <li><u>• Define Semi permeable Membranes</u></li> <li>Describe the principle of Ultra-Filtration</li> <li>Explain the merits of Ultrafiltration process.</li> <li>State the types of UF system.</li> </ul>	<p><del>023</del> hours Theory</p> <p><del>409</del> hours Practical</p> <p>Total hours 12</p>	Ultrafiltration Plant, UF membranes	Class Room and workplace
<b>LU6. Perform activated carbon filtration</b>	<ul style="list-style-type: none"> <li>Check <del>post</del> carbon filter</li> <li>Change carbon filter as per standard requirement</li> <li><del>• Operate RO water purifier</del></li> </ul>	<ul style="list-style-type: none"> <li><u>• Define Activated Carbon.</u></li> <li><del>• Define activated Carbon Filtration process.</del></li> <li><del>• Describe the principle of</del></li> </ul>	<p><del>023</del> hours Theory</p> <p><del>409</del> hours Practical</p>	Activated carbon filtration plant, Activated carbon filters, TDS meter, RO plant	Class Room and workplace

	<ul style="list-style-type: none"> <li>Operate <a href="#">Total Dissolved Solids (TDS) controllermeter</a></li> </ul>	<del>activated carbon filtration.</del> <ul style="list-style-type: none"> <li>Elaborate the composition of activated Carbon filters</li> <li><a href="#">Demonstrate activated Carbon Filtration process.</a></li> </ul>	Total hours 12		
<b>LU7. Ensure satisfactory working of Ozonator</b>	<p><del>P1:</del> Check the exact dose of ozone to water</p> <ul style="list-style-type: none"> <li><del>P2:</del> Ensure performance of ozonator as per advised in manual</li> <li><del>P3:</del> Check the pressure gauge on ozonator</li> </ul>	<ul style="list-style-type: none"> <li>Define Ozonation.</li> <li>Describe the principle of Ozonation Process.</li> <li><del>Describe the role of Ozone on micro flora of water.</del></li> <li><del>State the duration of ozone presence in water</del> <a href="#">Describe the benefits of ozonated water.</a></li> <li><a href="#">Demonstrate the working of Ozonator.</a></li> </ul>	04 hours Theory 10 hours Practical Total hours 14	Ozonator, pressure gauges, Ozone generator	Class Room and workplace
<b>LU8. Perform water testing</b>	<ul style="list-style-type: none"> <li>Determine TDS (total dissolved solids)</li> <li>Check microbial contamination of water</li> </ul>	<ul style="list-style-type: none"> <li>Define turbidity</li> <li><a href="#">Demonstrate major water quality tests (BOD, pH, Turbidity, Nitrate, Total Solids, Conductivity, Total Alkalinity, Fecal Bacteria)</a></li> </ul>	<del>023</del> hours Theory <del>409</del> hours Practical	Binocular Microscopes, Test tubes, colony counter, laminar flow hood, autoclave, petri plates, TDS	Class Room and workplace

	<ul style="list-style-type: none"> <li>• <del>Check-Ensure</del> sensory properties of water <u>as per standards</u></li> </ul>	<ul style="list-style-type: none"> <li>• <del>Describe the types of growth media to test microbiology of water</del></li> <li>• Enlist food microbiological contaminants e.g., Salmonella, Listeria Spp., E. Coli Rhinovirus etc</li> </ul>	Total hours 12	meter , pH meter, turbidity meter	
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## Module 205: Perform Non-Carbonated Beverage Processing

**Objective:** After completing this module, the learner will be able to apply skills and specific knowledge to perform non-carbonated beverage processing. The learner will be capable to understand pasteurization & homogenization processes and activities associated with non-carbonated beverage processing being applied in the food industry.

<b>Duration:</b>	<b>Total hours</b>	<b>150</b>	<b>Practical</b>	<b>120</b>	<b>Theory</b>	<b>30</b>
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
<b>LU1. Apply standard formulation procedure</b>	<ul style="list-style-type: none"> <li>Ensure availability of all ingredients (pulp) as per formulation</li> <li>Ensure formulation contains permitted ingredients</li> <li>Tag each food ingredients <u>appropriately as per standards</u></li> <li><u>Check-Ensure</u> the working of weighing balance and its calibration.</li> </ul>	<ul style="list-style-type: none"> <li><u>Define Non-Carbonated beverages</u></li> <li>Explain the types of non-carbonated beverages.</li> <li><u>Describe Demonstrate</u> the process of pulping.</li> <li><u>Enlist the additives used in beverages</u></li> <li>Describe the role of permitted additives e.g., sweeteners, colorants, flavors, acidulates, preservatives, clouding agents</li> </ul>	10 hours Theory  30 hours Practical  Total hours 40	Pulpers, crusher, juicer, squeezers, peeler, shredder, weighing balance	Class Room and workplace

		<p>etc., in beverage processing.</p> <ul style="list-style-type: none"> <li>• <a href="#">Describe</a> <a href="#">Demonstrate</a> <a href="#">calibration of the objective of equipment calibration.</a></li> </ul>			
<b>LU2. Apply mixing process</b>	<ul style="list-style-type: none"> <li>• Check the working of mixing tank /agitator</li> <li>• Check availability of all utilities</li> <li>• <a href="#">Check-Ensure</a> the cleaning of all equipment used</li> <li>• Check strainers and line filters are in sound condition.</li> </ul>	<ul style="list-style-type: none"> <li>• Define Cleaning in Place (CIP) &amp; Cleaning Out Place (COP)</li> <li>• <a href="#">Describe</a> <a href="#">Demonstrate</a> the process of straining and clarifying of beverages.</li> <li>• <a href="#">Describe the types of sanitizers used for equipment</a></li> <li>• <a href="#">Explain</a> <a href="#">Demonstrate</a> the process of disinfecting equipment and surfaces</li> </ul>	<p><a href="#">1206</a> hours Theory</p> <p><a href="#">3440</a> hours Practical</p> <p>Total hours 46</p>	Agitator, mixer, blender, strainers, filters, jars, bowls, <a href="#">Acids</a> , <a href="#">Caustic Soda</a> , <a href="#">Hot Water</a> –	Class Room and workplace
<b>LU3. Ensure Pasteurization and homogenization of <del>for</del> non-</b>	<ul style="list-style-type: none"> <li>• Check availability of steam <a href="#">for</a> pasteurization</li> <li>• <a href="#">Make sure-Ensure</a> pasteurizer temp gauge is</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Define</a> <a href="#">Pasteurization and homogenization</a></li> <li>• <a href="#">Define</a> <a href="#">Demonstrate</a> the</li> </ul>	<p><a href="#">089</a> hours Theory</p>	Pasteurizer, homogenizer, thermometers, <a href="#">Boiler</a> , –bowls, jars, buckets,	Class Room and workplace

<b>carbonated drinks</b>	<p>in working condition and calibrated.</p> <ul style="list-style-type: none"> <li>• <del>Ensure there is no leakage from the pasteurizer</del></li> <li>• Ensure homogenizer is in good working condition</li> <li>• Check the sample before and after homogenization</li> </ul>	<p>process of pasteurization.</p> <ul style="list-style-type: none"> <li>• <del>Explain the working of homogenizer.</del></li> <li>• <del>Describe the process of homogenization.</del></li> <li>• <del>Describe the conditions of pasteurization process for non-carbonated beverages</del></li> <li>• <del>Elaborate the conditions of homogenization process for non-carbonated beverages</del></li> </ul>	<p><del>3029</del> hours Practical</p> <p>Total hours 38</p>	<p>Binocular Microscopes, Test tubes, colony counter, laminar flow hood, autoclave, petri plates, TDS meter, pH meter, turbidity meter</p>	
<b>LU4. Filling of beverages</b>	<ul style="list-style-type: none"> <li>• Ensure quality of packaging material</li> <li>• Ensure all filters and strainers are in place before starting beverage filling.</li> <li>• Ensure product meet the quality parameters as per standard specifications</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the types of packaging material</li> <li>• Explain the types of closures</li> <li>• <del>Elaborate Demonstrate the role of labeling.</del></li> <li>• <del>Demonstrate the process of filling</del></li> </ul>	<p>06 hours Theory</p> <p>20 hours Practical</p> <p>Total hours 26</p>	<p>Filler, Caper, Labelling Machine, Strainer</p>	<p>Class Room and workplace</p>

	<ul style="list-style-type: none"> <li>• <del>Ensure</del> <u>Check</u> properly filling and sealing of capping machines</li> <li>• <del>Check</del> <u>Ensure</u> the working of <del>the</del> label and date coding printer</li> </ul>	•			
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## Module 624: Prepare Fermented Dairy Products

**Objective:** After completing this module, the learner will be able to understand the process of fermentation. The learner will also know about the production of cheese, evaporated milk, dry milk, yogurt and butter etc. The trainee will be able to learn production skills of various fermented dairy products.

Duration:	Total hours	150	Practical	120	Theory	30
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
LU1. <u>Prepare Prepare for the fermentation process for Processoperation</u>	<ul style="list-style-type: none"> <li>• <del>Confirmed</del> <u>Ensure</u> materials <del>available</del> <u>availability to meet production requirements</u> as per product demand</li> <li>• Standardize milk <del>for yogurt making</del> as per product requirement</li> <li>• <del>Confirm services as being ready for operation</del></li> <li>• <del>Check</del> <u>Ensure</u> equipment <del>to confirm</del> readiness for use</li> <li>• <del>Check</del> inoculum is ready for the fermentation process</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Define Fermentation</u></li> <li>• <del>Describe the purpose of fermentation process</del></li> <li>• <u>Enlist the types of cultures for fermentation.</u></li> <li>• <del>Demonstrate the general steps for making fermented dairy products.</del></li> <li>• <u>Describe the role of rennet</u></li> <li>• <del>Explain the conditions for efficient</del></li> </ul>	<p><del>150</del> hours Theory</p> <p><del>450</del> hours Practical</p> <p>Total hours: 60</p>	Incubator, Milk analyzer, Petri dishes, <u>Culture Media</u>	Class Room and workplace

	<ul style="list-style-type: none"> <li>• <del>Set the fermentation process to meet production specifications</del></li> </ul>	<del>fermentation process</del> <ul style="list-style-type: none"> <li>• <del>Explain</del><del>laborate</del> the Importance of Inoculum</li> <li>• Describe the types of heat treatment for milk</li> </ul>			
<b>LU2. <del>Operate and m</del>Monitor the fermentation process</b>	<ul style="list-style-type: none"> <li>• Start the fermentation process according to <del>company specifications</del><u>SOPs</u></li> <li>• <del>Monitor</del> control points to confirm that performance is maintained within specification</li> <li>• <del>Monitor</del><u>Check</u> equipment <del>to confirm</del> operating condition</li> <li>• <del>Maintain record</del></li> <li>• <del>Stock flow to and from the fermentation process is maintained within production requirements</del></li> </ul>	<ul style="list-style-type: none"> <li>• Explain the types of starters</li> <li>• Describe <del>about</del> the fermentation process of milk</li> <li>• <del>Elaborate</del><u>Describe</u> the role of microorganisms in fermentation</li> <li>• <u>Enlist fermented milk products.</u></li> <li>• <del>Explain the recordkeeping procedures.</del></li> <li>• <del>Explain the control points within the fermentation process</del></li> </ul>	<del>150</del> hours Theory  <del>450</del> hours Practical  Total hours: 60	Incubator, Milk analyzer, Petri dishes, Stainless Steel Bowl and dishes, <u>Stationary items</u>	Class Room and workplace

<b>LU3. Shut down fermentation process</b>	<p><b>P1:-</b>● Shutdown fermentation process according to <del>company</del> <u>proceduresSOPs</u></p> <p><b>P2:-</b>● Collect and dispose off <del>i</del> waste according to <del>company waste management</del> <u>proceduresSOPs.</u></p>	<ul style="list-style-type: none"> <li>• Explain the shutdown procedures</li> <li>● <del>Describe the cleaning requirements associated with changeovers</del></li> <li>• Explain the effect of <del>the</del> fermentation process on the end product.</li> <li>● <del>Describe the quality characteristics of fermentation process</del></li> <li>• Explain the common causes of variation and corrective action</li> </ul>	<p><del>046</del> hours Theory</p> <p><del>120</del> hours Practical</p> <p>Total hours: 16</p>	<p>pH Meter, Titration apparatus</p>	<p>Class Room and workplace</p>
<b>LU4. Recording information</b>	<p><b>P1:-</b>● Record workplace information in the appropriate format</p> <p><b>P2:-</b>● Ensure record of all consumables as per requirements</p>	<ul style="list-style-type: none"> <li>● <del>Explain the record keeping procedures</del> Define Coagulation</li> <li>● <del>Difference between Curd and yogurt</del></li> <li>● <del>Explain the role of pH in yogurt Preparation</del></li> </ul>	<p><del>034</del> hours Theory</p> <p><del>110</del> hours Practical</p>	<p>Computer accessories and printers</p>	<p>Class Room and workplace</p>



		<ul style="list-style-type: none"> <li>• <u>Describe the stages and changes occurred during fermentation</u></li> <li>• <u>Describe the importance of record keeping</u></li> </ul>	Total hours: 14		
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## Module 227: Prepare Non-Fermented Dairy Products

**Objective:** After completing this module, the learner will be able to apply skills and knowledge to perform pasteurization, Ultra Heat Treatment (UHT), prepare non-fermented dairy products such as pasteurized milk, UHT milk, milk powder etc. The trainees will be able to enhance skills for production of non-fermented dairy products.

Duration:	Total hours	120	Practical	90	Theory	30
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
LU1. <del>Receiving</del> <u>Receive</u> milk	<ul style="list-style-type: none"> <li><del>Perform-Monitor</del> milk sampling</li> <li><del>Perform-Perform</del> sensory evaluation</li> <li>Perform milk analysis (Fat, SNF, pH, COB and APT tests)</li> <li><del>Perform-Ensure</del> adulteration tests</li> </ul>	<ul style="list-style-type: none"> <li>Define Milk</li> <li>Describe different adulterants used in milk</li> <li><del>Explain</del> <u>Demonstrate the role of ethanol in</u> APT test of milk</li> <li><del>Describe</del> <u>Demonstrate</u> the methods of sensory evaluation</li> </ul>	0 <u>34</u> hours Theory  1 <u>10</u> hours Practical  Total hours: 14		Class Room and workplace
LU2. Perform pasteurization	<ul style="list-style-type: none"> <li>Check pasteurizer to confirm readiness for use</li> <li>Set time and temperature for pasteurization</li> </ul>	<ul style="list-style-type: none"> <li><del>Define</del> Pasteurization</li> <li><del>Describe the role of pasteurization in</del></li> </ul>	0 <u>34</u> hours Theory  1 <u>10</u> hours Practical	Pasteurizer, plate heat exchanger, Fat separator, Deodorizer Homogenizer	Class Room and workplace

	<ul style="list-style-type: none"> <li>Operate pasteurizer to meet production as per standard requirements</li> </ul>	<ul style="list-style-type: none"> <li><del>non-fermented liquid</del> milk</li> <li><del>Write down the name</del> <u>Enlist the</u> of target microorganisms <del>during for</del> pasteurization</li> <li><del>Enlist</del> <u>Demonstrate the types-working</u> of pasteurizers</li> <li></li> </ul>	Total hours: 14		
<b>LU3. Perform fat separation as per product requirement</b>	<ul style="list-style-type: none"> <li><del>Prepare-Check</del> the fat separator for operation</li> <li>Operate fat separator as per manufacturer requirement</li> <li>Collect cream from separator</li> <li>Ensure record-keeping in the standard format</li> </ul>	<ul style="list-style-type: none"> <li><del>Describe-Enlist</del> the sources of fat for human use</li> <li><del>Differentiate between vegetable and butter fat</del></li> <li><del>Describe the role of butter fat in human nutrition</del></li> <li><del>Describe about the</del> <u>Define</u> skimmed milk</li> <li><u>Explain</u> the types of creams separated from milk</li> </ul>	034 hours Theory  110 hours Practical  Total hours: 14	Fat separator, Skimming machine, <u>Milk</u>	Class Room and workplace

		<ul style="list-style-type: none"> <li>• <u>Demonstrate the working of fat separator</u></li> </ul>			
<b>LU4. Perform milk standardization</b>	<ul style="list-style-type: none"> <li>• Standardize pasteurized milk by fat addition</li> <li>• Perform analysis for <u>Solid Not Fat (SNF)</u> and Fat % in pasteurized milk</li> <li>• Ensure record-keeping in the standard format</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Define <del>Toning and standardization</del> of milk</u></li> <li>• <u>Define fortified milk</u></li> <li>• <u>Describe the purpose of milk standardization</u></li> <li>• <u>Demonstrate the standardization process</u></li> <li>• Describe the purpose of SNF estimation test</li> <li>• <u>Explain <del>Demonstrate</del> the principle-working of Gruber Gerber machine</u></li> <li>• <u>Define fortified milk</u></li> </ul>	034 hours Theory  110 hours Practical  Total hours: 14	Homogenizer, Mixer, agitator, fat separator	Class Room and workplace
<b>LU5. Pack- pasteurized milk</b>	<ul style="list-style-type: none"> <li>• Operate pasteurized milk filler</li> <li>• Maintain sufficient packaging material and record-keeping of packaging material</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Describe-Enlist</u> the types of packaging materials used for milk</li> <li>• <u>Demonstrate the packaging of pasteurized milk</u></li> </ul>	034 hours Theory  110 hours Practical	Pasteurizer, Milk filler, Packaging machine, Blow moulding machine,	Class Room and workplace

	<ul style="list-style-type: none"> <li>• Monitor proper labeling of products</li> <li>• <u>Ensure</u> <del>Record</del> keeping in the standard format</li> </ul>	<ul style="list-style-type: none"> <li>• <del>Explain the merits of Tetra pack packaging</del></li> <li>• <del>Describe about the food labeling (Dairy products)</del></li> <li>• <del>Elaborate the shelf life of pasteurized dairy products</del></li> </ul>	Total hours: 14	sealing machine <u>Packaging material (Plastic, paper and glass)</u>	
<b>LU6. Operate milk evaporator</b>	<ul style="list-style-type: none"> <li>• <del>Run</del> <u>Monitor working of</u> milk evaporator as per <del>company requirement</del> <u>SOPs</u></li> <li>• <del>Record</del> <u>Ensure record of</u> all parameters and product specifications</li> <li>• Perform CIP of <del>evaporator</del> <u>evaporation</u> plant</li> </ul>	<ul style="list-style-type: none"> <li>• Define evaporation</li> <li>• Describe the principles of multiple effect evaporators</li> <li>• Describe the types of evaporators</li> <li>• <u>Demonstrate the evaporation process</u></li> <li>• <del>Describe</del> <u>Enlist</u> the cleaning agents for CIP of evaporators</li> <li>• <u>Demonstrate the CIP</u> <del>Explain the role of temperature and humidity in milk evaporation</del></li> <li>• <u></u></li> </ul>	04 hours Theory 12 hours Practical Total hours: 16	Evaporators, boiler	Class Room and workplace

<b>LU7. Prepare <u>Ultra High Temperature (UHT) Treated milk</u></b>	<ul style="list-style-type: none"> <li>• Check UHT <u>equipment</u> to <del>confirm</del> readiness for use</li> <li>• <del>Set</del> <u>Ensure</u> time and temperature for UHT <u>treatment</u></li> <li>• Operate UHT to meet production as per <del>standard requirements</del> <u>SOPs</u></li> </ul>	<ul style="list-style-type: none"> <li>• Define UHT</li> <li>• <u>Differentiate between HTST and LTLT</u></li> <li>• <del>Define Sterilization</del></li> <li>• <u>Demonstrate UHT process</u></li> <li>• Describe the effect of UHT on shelf life of milk</li> <li>• <del>Describe about the HTST and LTLT</del></li> <li>• <u>Describe the benefits of UHT milk processing</u></li> <li>• <del>Explain the role of homogenizer</del></li> </ul>	<p>032 hours Theory</p> <p>119 hours Practical</p> <p>Total hours: 14</p>	UHT plant, Homogenizer, <u>Milk</u>	Class Room and workplace
<b>LU8. Pack UHT <u>treated</u> milk</b>	<p><b>P1:-</b> • <u>Operate</u> UHT milk filler/Tetra pack machine</p> <p><b>P2:-</b> • <u>Maintain</u> sufficient packaging material and record-keeping of packaging material</p> <p><b>P3:-</b> • <del>Monitor</del> <u>Ensure</u> proper labeling of products</p> <p><b>P4:-</b> • <u>Maintain</u> Record <del>keeping in the standard format</del> <u>as per standard format</u></p>	<ul style="list-style-type: none"> <li>• <u>Describe</u> the types of Packaging material for UHT milk</li> <li>• <del>Demonstrate</del></li> <li>• <del>Describe</del> the <u>principle of working of</u> Tetra pack machine <del>in milk sterilization</del></li> </ul>	<p>02 hours Theory</p> <p>08 hours Practical</p> <p>Total hours: 10</p>	Tetra pack machine, sealing machine, <u>Milk Packaging material</u>	Class Room and workplace

		<ul style="list-style-type: none"> <li>Explain the role of Hydrogen per oxide (H<sub>2</sub>O<sub>2</sub>) in Tetra pack machine</li> </ul>			
<b>LU9. Prepare milk powder</b>	<ul style="list-style-type: none"> <li>Check milk dryer to confirm readiness for use</li> <li><del>Set</del> <u>Ensure</u> time and temperature for drying <u>as per SOPs</u></li> <li>Operate milk/spray dryer to meet production as per standard requirements</li> <li>Perform routine analysis (Fat, moisture, density)</li> </ul>	<ul style="list-style-type: none"> <li><u>Demonstrate the procedure of powdered milk preparation</u></li> <li><del>Describe</del> <u>Enlist</u> the types of Milk powders</li> <li><del>Describe</del> <u>Enlist</u> the types of dryers used for milk</li> <li><u>Demonstrate</u> <del>Explain</del> the <u>principle-working</u> of spray dryer</li> <li>Differentiate between instant and non-instant milk powder</li> </ul>	032 hours Theory  409 hours Practical  Total hours: 12	Drum dryer, spray dryer, packaging machine for milk powder,	Class Room and workplace

## Module 238: Perform Egg Processing and Preservation

**Objective:** After completing this module, the learner will be able to apply skills and required knowledge to demonstrate the Receiving of Eggs, Grading and coating of eggs. The learner will also be capable to produce egg powder and will learn about the processing and preservation of eggs.

Duration:	Total hours	100	Practical	80	Theory	20
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
LU1. Receive eggs	<ul style="list-style-type: none"> <li>Check cleaning of eggs</li> <li><del>Check-Monitor</del> cleanliness of egg trays</li> <li><del>Check-Ensure</del> expiry date of eggs</li> <li>Perform water soaking test of eggs</li> </ul>	<ul style="list-style-type: none"> <li>Describe hygiene principles for receiving eggs</li> <li><del>Enlist types of cleaning agents</del></li> <li><del>Describe the egg transportation temperature.</del></li> <li><del>Explain-Enlist about the</del> types of trays or cartons used for eggs</li> <li><del>Demonstrate the procedure for receiving and storing eggs</del></li> <li><del>Describe about the handling of eggs</del></li> <li><del>Describe the types of cleaning agents</del></li> </ul>	<p>064 hours Theory</p> <p>1820 hours Practical</p> <p>Total hours: 24</p>	Cartons, Baskets, Trays,	Class Room and workplace



<b>LU2. Grade and apply coating on eggs</b>	<ul style="list-style-type: none"> <li>• <del>Monitor Candling of Eggs</del> <u>eggs using appropriate equipment in a light-proof area.</u></li> <li>• <del>Ensure Grading of Eggs</del> <u>eggs according to weight and quality</u></li> <li>• Report to the supervisor according to organization procedures in case of <del>rotten eggs</del> <u>non-conforming eggs</u>.</li> <li>• <del>Ensure Washing of Eggs</del> <u>with running water</u></li> <li>• <del>Ensure coating of Oil Eggs</del> <u>when required according to legislative requirements and organizational practice</u></li> </ul>	<ul style="list-style-type: none"> <li>• Define Grading of eggs</li> <li>• <u>Explain the importance of egg grading.</u></li> <li>• <u>Demonstrate grading process</u></li> <li>• <del>Describe</del> <u>Enlist</u> different coating materials for eggs</li> <li>• Explain the advantages of coatings</li> <li>• <del>Demonstrate</del> <u>Describe the types of grading (Weight, Quality characteristics) of eggs</u></li> <li>• <del>Describe coating of egg</del> <u>the principle of egg preservation by use of coatings</u></li> </ul>	06 hours Theory  20 hours Practical  Total hours: 26	Coating materials, polisher, waxing machine,	Class Room and workplace
<b>LU3. Store eggs</b>	<ul style="list-style-type: none"> <li>• <u>Ensure Clean cleaning and sanitization of</u> cold store</li> <li>• Monitor temperature and humidity of cold store</li> </ul>	<ul style="list-style-type: none"> <li>• Define eggs spoilage</li> <li>• Explain factors responsible for deterioration of <del>eggs</del> <u>quality</u></li> </ul>	06 hours Theory  20 hours Practical	Refrigerator, freezer,	Class Room and workplace

	<ul style="list-style-type: none"> <li>Maintain records of cold store temperature and humidity.</li> </ul>	<ul style="list-style-type: none"> <li><u>Explain the requirements of egg storage.</u></li> <li><u>Define shelf life of eggs</u></li> <li><del>Define candling of eggs</del></li> <li>Explain the types of storage for shell eggs and shelled eggs</li> </ul>	Total hours: 26		
<b>LU4. Produce egg powder</b>	<ul style="list-style-type: none"> <li><del>Ensure Remove</del> <u>shelling of eggs</u> egg shells</li> <li><del>Perform S</del> <u>eparation of</u> egg yolk/egg white</li> <li>Operate spray dryer</li> <li>Operate drum dryer</li> <li><del>Ensure F</del> <u>illing of</u> egg powder with nitrogen (inert gas) Pack and store egg powder in cold store.</li> </ul>	<ul style="list-style-type: none"> <li><del>Describe about the</del> <u>Enlist</u> types of dryers used in production of egg powders</li> <li><del>Demonstrate the working of</del> <u>Explain the working principle of</u> dryers</li> <li>Describe the role of Nitrogen gas in egg packaging</li> <li><del>Describe</del> <u>Enlist</u> the uses of egg powder</li> <li><del>Elaborate the types of egg powder</del></li> </ul>	064 hours Theory  1820 hours Practical  Total hours: 24	Spray dryer Drum dryer, evaporator, homogenizer, yolk separator, shelling machine, <u>Eggs</u>	

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## Module 249: Perform Sea Food Processing

**Objective:** After completing this module, the learner will be able to process sea food especially fish and improve cutting skills. The trainees will be capable to handle fish and seafood safely, receive the raw material, perform preparatory operations, perform cutting, filleting of fish and storage of sea foods.

Duration:	Total hours	100	Practical	80	Theory	20
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
<b>LU1. Receive the raw material</b> <b>1</b>	<ul style="list-style-type: none"> <li>Check freshness of sea food according to standards</li> <li>Perform salting and grading on basis of size, freshness, species and damage</li> <li><del>Maintain and e</del>Ensure storage temperature at reception</li> </ul>	<ul style="list-style-type: none"> <li>Describe the guidelines for handling of <del>fish and</del> sea food</li> <li>Explain the classifications of Sea foods</li> <li>Differentiate between marine and sea foods</li> <li><del>Elaborate the role of salt</del> <u>Demonstrate salting of fish in fish processing</u></li> </ul>	032 hours Theory  112 hours Practical  Total hours: 14	Cutting boards, knives, de-scaler,  Rubber gloves or safety gloves  <u>Seafood</u>	Class Room and workplace

		<ul style="list-style-type: none"> <li>Enlist the quality points for analyzing fish</li> </ul>			
<b>LU2. Perform preparatory operations</b>	<p><b>P1:</b> Perform blanching and washing to remove slime</p> <p><b>P2:</b> Operate scaler machine to remove scales</p> <p><b>P3:</b> Apply Perform de-heading of fish</p> <p><b>P4:</b> Remove fins Ensure removal of fins</p> <p><b>P5:</b> Perform gutting and remove viscera</p>	<ul style="list-style-type: none"> <li>Define blanching</li> <li>Describe Demonstrate the process of Slime removal</li> <li>Enlist processing steps of sea foods</li> <li>Define evisceration</li> <li>Describe Enlist the classes of about the categories of fish</li> <li>Explain the category of cutting board used for sea foods</li> </ul>	<p>076 hours Theory</p> <p>234 hours Practical</p> <p>Total hours: 30</p>	Scaling machine, knives, choppers, blanchers <a href="#">Seafood</a>	Class Room and workplace
<b>LU3. Perform cutting and filleting</b>	<p><b>P1:</b> Perform cutting of fish</p> <p><b>P2:</b> Prepare fish fillets</p>	<ul style="list-style-type: none"> <li>Describe the types of fish cuts</li> <li>Describe the use of different fish cuts</li> </ul>	<p>096 hours Theory</p> <p>2730 hours Practical</p>	Cutting Boards, knives, choppers, slicer <a href="#">Seafood</a>	Class Room and workplace

		<ul style="list-style-type: none"> <li>• <a href="#">Demonstrate seafood cutting procedures</a></li> <li>• <a href="#">Define Demonstrate filleting.</a></li> <li>• <a href="#">Define skinning and</a></li> <li>• <a href="#">Define deboning</a></li> </ul>	Total hours: 36		
<b>LU4. Pack and store fish cuts</b>	<ul style="list-style-type: none"> <li>• <a href="#">Ensure</a> Use <a href="#">of</a> appropriate packaging material for fish cuts</li> <li>• Ensure storage of fish products at recommended temperature</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Describe-Enlist about the</a> types of packaging material used for sea foods</li> <li>• <a href="#">Demonstrate the seafood packaging procedures</a></li> <li>• <a href="#">Explain-Enlist about the</a> spoilage agents in fish storage</li> <li>• Describe the temperature zones for fish storage (Freezing, danger zone, etc.)</li> </ul>	<del>056</del> hours Theory  <del>154</del> hours Practical  Total hours: 20	wrapping machine, sealing machine, Ice making machine, ice crushing machine, <a href="#">Packaging material</a>	Class Room and workplace





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## Module ~~25~~10: Prepare Snacks

**Objective:** After completing this module, the learner will be able to apply skills and knowledge required to prepare snack food products and store them accordingly. The trainees will be capable to perform moulding, baking, frying and enhance skills for the production of various types of snacks

<b>Duration:</b>	<b>Total hours</b>	<b>110</b>	<b>Practical</b>	<b>90</b>	<b>Theory</b>	<b>20</b>
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials (Tools & Equipment) Required	Learning Place
<b>LU1. Receive &amp; Prepare ingredients</b>	<ul style="list-style-type: none"> <li>• <del>Ensure</del> <u>Receive</u> <del>receiving of</del> ingredients as per protocols</li> <li>• <del>Select</del> <u>Check</u> ingredients for batch preparation as per manufacturing order</li> <li>• <del>Check</del> <u>Ensure</u> quality parameters of received goods.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Define Snacks</u></li> <li>• Enlist the different <del>commodities</del> <u>additives</u> used in snack preparation</li> <li>• Explain the role of different additives used in snack preparation (Preservatives, caking agents, flavoring agents, spices, colorants, emulsifier and stabilizers etc.)</li> <li>• Describe the role of gluten in snack products</li> </ul>	<p>0<u>5</u>4 hours Theory</p> <p>1<u>5</u>6 hours Practical</p> <p>Total hours: 20</p>	Balance, moisture detector, thermometer, pH meter, Refractometer, <u>Snack ingredients</u>	Class Room and workplace

<b>LU2. Mix ingredients</b>	<ul style="list-style-type: none"> <li>• Ensure the standard mixing of dry and wet ingredients for batch making</li> <li>• Check viscosity, moisture and uniformity of mixtures</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the classification of Snacks</li> <li>• Define Viscosity</li> <li>• <a href="#">Demonstrate the mixing procedure</a></li> <li>• <a href="#">Elaborate the types of mixing</a></li> <li>• <a href="#">Explain the importance of mixing</a></li> </ul>	04 hours Theory 14 hours Practical Total hours: 18	Mixer, Agitator, Dough mixer, Sheeter, <a href="#">Raw Material</a>	Class Room and workplace
<b>LU3. Perform Moulding</b>	<ul style="list-style-type: none"> <li>• <a href="#">Select-Check</a> moulds as per product specifications <del>es</del></li> <li>• Ensure cleaning of moulds before processing</li> <li>• <a href="#">Perform Load-loading of the</a> batch in moulding machine</li> </ul>	<ul style="list-style-type: none"> <li>• Define Moulding Process</li> <li>• <a href="#">Demonstrate</a> <del>Describe</del> the process of extrusion</li> <li>• Explain <a href="#">about the</a> parts of Extruder</li> <li>• Describe the role of Dyes in extruder</li> <li>• Enlist cleaning agents used for CIP.</li> </ul>	<del>06</del> 4 hours Theory  <del>18</del> 20 hours Practical Total hours: 24	Extruder, Moulds, dyes,	Class Room and workplace
<b>LU4. Perform Frying/Baking</b>	<ul style="list-style-type: none"> <li>• <a href="#">Check-Ensure</a> fryer and its utilities before operation</li> <li>• Check oven for temperature adjustment</li> <li>• Ensure cleaning of all accessories</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Demonstrate</a><del>Define</del> the process of frying</li> <li>• <a href="#">Demonstrate</a><del>Define</del> the process of baking <a href="#">and its merits</a></li> <li>• Explain the Millard browning.</li> <li>• Define caramelization</li> <li>• Define rancidity</li> </ul>	<del>06</del> 4 Hours Theory  <del>18</del> 20 hours Practical	Fryer, Conveyer/ Baking oven, Trays,	Class Room and workplace

	<ul style="list-style-type: none"> <li>Operate fryer/Baking oven</li> </ul>		Total hours: 24		
<b>LU5. Ensure cooling</b>	<p><b>P1:-</b> <a href="#">Check Transfer transfer</a> batch to cooling section to ensure integrity of product</p> <p><b>P2:-</b> <a href="#">Follow-Ensure</a> time and temperature according to prepared batch.</p>	<ul style="list-style-type: none"> <li><a href="#">Describe the cooling method for snacks</a></li> <li>Describe the effect of holding/cooling process in snacks</li> <li>Explain the impact of moisture on quality of snacks</li> </ul>	<p><del>032</del> Hours Theory</p> <p><del>940</del> hours Practical</p> <p>Total hours: 12</p>	Cooling racks, Blowers	
<b>LU6. Pack and store snack products</b>	<ul style="list-style-type: none"> <li>Select appropriate packaging material</li> <li>Operate packaging machine</li> <li><a href="#">Check-Ensure</a> storage temperature of stored products</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Demonstrate the snack packaging procedures</a></li> <li><del>Describe-Enlist</del> the types of packaging material <del>used in snacks packaging</del></li> <li>Explain the role of Nitrogen gas in packaging</li> <li>Describe the storage conditions of snacks</li> <li>Describe the importance of labeling</li> </ul>	<p><del>032</del> Hours Theory</p> <p><del>409</del> hours Practical</p> <p>Total hours: 12</p>	Sealer, wrapping machine, Vacuum packaging machine,	

<u>Sr. No.</u>	<u>Consumable Items</u>	<u>Quantity for 24 candidates</u>
<u>12.</u>	<u>Phenolphthalein</u>	<u>1 Bottle (100 gm)</u>
<u>13.</u>	<u>Burette Set</u>	<u>6 No.</u>
<u>14.</u>	<u>Pipette 1ml</u>	<u>10 No.</u>
<u>15.</u>	<u>Pipette 5ml</u>	<u>10 No.</u>
<u>16.</u>	<u>Pipette 10 ml</u>	<u>10 No.</u>
<u>17.</u>	<u>Pipette 10.94 ml</u>	<u>5 No.</u>
<u>18.</u>	<u>Auto sucker</u>	<u>10 No.</u>
<u>19.</u>	<u>Volumetric flask 100 ml</u>	<u>5 No.</u>
<u>20.</u>	<u>Volumetric flask 250 ml</u>	<u>5 No.</u>
<u>21.</u>	<u>Volumetric flask 500 ml</u>	<u>5 No.</u>
<u>22.</u>	<u>Volumetric flask 1000 ml</u>	<u>5 No.</u>
<u>23.</u>	<u>Measuring Cylinder 100 ml</u>	<u>5 No.</u>
<u>24.</u>	<u>Measuring Cylinder 500 ml</u>	<u>5 No.</u>
<u>25.</u>	<u>Measuring Cylinder 1000 ml</u>	<u>5 No.</u>
<u>26.</u>	<u>Reagent Bottles</u>	<u>10 No.</u>
<u>27.</u>	<u>Glass Beaker 50 ml</u>	<u>5 No.</u>
<u>28.</u>	<u>Glass Beaker 100 ml</u>	<u>5 No.</u>
<u>29.</u>	<u>Glass Beaker 250 ml</u>	<u>5 No.</u>
<u>30.</u>	<u>Glass Beaker 500 ml</u>	<u>5 No.</u>
<u>31.</u>	<u>Capillary tube</u>	<u>1 Box</u>
<u>32.</u>	<u>Filter paper (90 mm)</u>	<u>2 Box</u>
<u>33.</u>	<u>Lactometer</u>	<u>10 No.</u>
<u>34.</u>	<u>Rubber stoppers</u>	<u>20 No.</u>
<u>35.</u>	<u>China Dish</u>	<u>10 No.</u>
<u>36.</u>	<u>Test tube 20 ml</u>	<u>20 No.</u>
<u>37.</u>	<u>Thermometer (0-100 C)</u>	<u>10 No.</u>
<u>38.</u>	<u>Plate Count Agar</u>	<u>1 box</u>
<u>39.</u>	<u>Swab Sticks</u>	<u>1 Box</u>
<u>40.</u>	<u>S-S Agar</u>	<u>1 Box</u>
<u>41.</u>	<u>Inoculating loops</u>	<u>5 No.</u>

<u>42.</u>	<u>Spirit lamp</u>	<u>5 No.</u>
<u>43.</u>	<u>Hexane</u>	<u>2.5 ltr</u>
<u>44.</u>	<u>CMC</u>	<u>1 kg</u>
<u>45.</u>	<u>Citric Acid</u>	<u>1 kg</u>
<u>46.</u>	<u>Pectin Powder</u>	<u>1 kg</u>
<u>47.</u>	<u>Sodium benzoate</u>	<u>100 gm</u>
<u>48.</u>	<u>KMS</u>	<u>100 gm</u>
<u>49.</u>	<u>Sodium Citrate</u>	<u>100 gm</u>
<u>50.</u>	<u>Baking Powder</u>	<u>1 kg</u>
<u>51.</u>	<u>Yeast (Sachet)</u>	<u>50 No.</u>
<u>52.</u>	<u>Baking Soda</u>	<u>1 kg</u>
<b><u>COLORS</u></b>		
<u>53.</u>	<u>Caramel Liquid</u>	<u>100 ml</u>
<u>54.</u>	<u>Apple Green</u>	<u>100 gm</u>
<u>55.</u>	<u>Sunset Yellow</u>	<u>100 gm</u>
<u>56.</u>	<u>Apple Red</u>	<u>100 gm</u>
<u>57.</u>	<u>Cloudifying Agent</u>	<u>250 ml</u>
<u>58.</u>	<u>Lime YELLOW</u>	<u>100 gm</u>
<b><u>FLAVORS</u></b>		
<u>59.</u>	<u>Apple</u>	<u>250 ml</u>
<u>60.</u>	<u>Strawberry</u>	<u>250 ml</u>
<u>61.</u>	<u>Mango Chaunsa</u>	<u>250 ml</u>
<u>62.</u>	<u>Chocolate</u>	<u>250 ml</u>
<u>63.</u>	<u>Vanilla</u>	<u>250 ml</u>
<u>64.</u>	<u>Orange</u>	<u>250 ml</u>
<u>65.</u>	<u>Pineapple</u>	<u>250 ml</u>
<b><u>SPICES</u></b>		
<u>66.</u>	<u>Salt</u>	<u>1 kg</u>
<u>67.</u>	<u>Red Chili (Powder)</u>	<u>1 kg</u>
<u>68.</u>	<u>Black pepper (Powder)</u>	<u>500 gm</u>
<u>69.</u>	<u>Mix masala</u>	<u>500 gm</u>
<u>70.</u>	<u>Chicken, Beef, Mutton, Fish</u>	<u>10 kg each</u>

<u>71.</u>	<u>Fine Flour</u>	<u>20 kg</u>
<u>72.</u>	<u>Sugar</u>	<u>50 kg</u>
<u>73.</u>	<u>Cooking Oil</u>	<u>10 ltr</u>
<u>74.</u>	<u>Ghee</u>	<u>5 kg</u>
<u>75.</u>	<u>Peas</u>	<u>10 kg</u>
<u>76.</u>	<u>Lemon</u>	<u>5 kg</u>
<u>77.</u>	<u>Tomatoes</u>	<u>10 kg</u>
<u>78.</u>	<u>Potatoes</u>	<u>10 kg</u>
<u>79.</u>	<u>Green Chili</u>	<u>2 kg</u>
<u>80.</u>	<u>Capsicum</u>	<u>2 kg</u>
<u>81.</u>	<u>Carrot</u>	<u>10 kg</u>
<u>82.</u>	<u>Apple</u>	<u>10 kg</u>
<u>83.</u>	<u>Mango</u>	<u>10 kg</u>
<u>84.</u>	<u>Orange</u>	<u>10 Dozen</u>
<u>85.</u>	<u>Strawberry</u>	<u>10 kg</u>
<u>86.</u>	<u>Pineapple</u>	<u>10 kg</u>
<u>87.</u>	<u>Cheddar Cheese</u>	<u>10 kg</u>
<u>88.</u>	<u>Mozzarella Cheese</u>	<u>10 kg</u>
<u>89.</u>	<u>Skimmed Milk Powder</u>	<u>1 Kg</u>
<u>90.</u>	<u>Condensed Milk</u>	<u>5 Jar</u>
<u>91.</u>	<u>Fresh Milk</u>	<u>20 ltr</u>
<u>92.</u>	<u>Empty Metal Can (500 gm)</u>	<u>25 No.</u>
<u>93.</u>	<u>Empty Plastic Bottles (750 ml)</u>	<u>50 No</u>
<u>94.</u>	<u>Empty Glass Jars (500 gm)</u>	<u>25 No.</u>
<u>95.</u>	<u>Plastic Wrapping Sheet</u>	<u>1 Roll</u>
<u>96.</u>	<u>Aluminum Foil</u>	<u>2 Roll</u>