Co-funded by the European Union

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Norwegian Embassy
Islamabad

FOOD PROCESSING & PACKAGING TECHNICIAN

CBT Curriculum

National Vocational Certificate Level 3

Version 1 - November, 2019

NAVTTC

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Published by
National Vocational and Technical Training Commission
Government of Pakistan

Headquarter
Plot 38, Kirthar Road, Sector H-9/4, Islamabad, Pakistan
www.navttc.org

Responsible
Director General Skills Standard and Curricula, National Vocational and Technical Training Commission
National Deputy Head, TVET Sector Support Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Layout & design
SAP Communications

Photo Credits
TVET Sector Support Programme

This document has been produced with the technical assistance of the TVET Sector Support Programme, which is funded by the European Union, the Federal Republic of Germany and the Royal Norwegian Embassy and has been commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close collaboration with the National Vocational and Technical Training Commission (NAVTTC) as well as provincial Technical Education and Vocational Training Authorities (TEVTAs), Punjab Vocational Training Council (PVTC), Qualification Awarding Bodies (QABs)s and private sector organizations.

Document Version
November, 2019
Islamabad, Pakistan

FOOD PROCESSING & PACKAGING TECHNICIAN

CBT Curriculum

National Vocational Certificate Level 3

Version 1 - November, 2019

TABLE OF CONTENTS

1. INTRODUCTION

This course is aimed at introducing and developing the basic skills and knowledge of Food processing Industry. The trainee is introduced in a step by step manner to the various elements of the discipline and their implications. Ranging from the knowledge and skills required to prepare work environment according to the food processing order, product raw materials and perform packaging. The trainees are encouraged to experiment with a focus on acquiring a wide range of new skills for meeting the new trends in food industry both in processing and packaging. Trainee is also exposed to the commercial market and taught how to deal with clients and their demands in food processing industry.

In order to improve the quality of training and to ensure relevance, National Vocational & Technical Training Commission (NAVTTC) through Qualification Development Committee (QDC) developed National Competency Standards for Food Processing & Packaging Technician. The learning outcomes provided in this curriculum forms the basis, which is in accordance with the approved National Competency Standards for Food Processing & Packaging Technician. The curriculum can be implemented in a variety of pathways and provides flexible learning opportunities in public and private sector as well as industry based institutes.

1. PURPOSE OF THE TRAINING PROGRAMME

In this training program trainee will learn and acquire specialized knowledge and practical skills required to function as a Food Processing & Packaging Technician in Food Processing and Packaging industry. The specific objectives of developing these qualifications are as under:

- Improve the overall quality of training delivery and setting national benchmarks for training of Food Processing & Packaging Technician in the country.
- Provide flexible pathways and progressions to learner enabling them to receive relevant, up-to-date and current skills in Food Industry.
- Provide basis for competency-based assessment which is recognized and accepted by employers in modern days.
- Establish a standardized and sustainable system of training in consultation with the industry for Food Processing & Packaging Technician in the country.

2. OVERALL OBJECTIVES OF TRAINING COURSE

The primary objective of this two years certificate course in Food Processing & Packaging Technician is to provide the trainees with a comprehensive introduction in food industry. At present there are no skill standards at national level in Food Processing Industry. These standards will develop trainee's abilities, interests and offers outstanding opportunities at different stages of Food Sector. It will encourage individual to learn knowledge and skills in related field of Food Processing. He/she should have the capability to get job in food industry after successful completion of two years (level 1-4) course. Trainee must take part in commercial activities after seeking training in this sector. It will help the trainees to start their own commercial activities as an independent skilled worker in Food Sector or an employee in a commercial setup. He/she will also made aware of the ever changing and evolving demands and challenges of market trends in Food Industry. This course will be opened to all Science matriculate students for enhancing their capabilities in this field.

3. COMPETENCIES TO BE GAINED AFTER COMPLETION OF COURSE

The study of Food Processing & Packaging Technician enables trainee to develop a range of competencies including, creative thinking, research skills, personal management, presentation skills, communication, negotiation skills and technical competence related to their job assignment. Such competencies acquired and enhanced during the course of study results in highly employable pass outs. In addition, the trainee will be able to acquire the following competencies after completing this course:

- Demonstrate and apply basic knowledge and concepts in food processing industry
- Develop creative thinking skills and perceptual awareness in food processing industry
- Develop skills necessary for understanding and applying skills during work
- Explore and discuss unique properties and potential of technical work
- Demonstrate techniques and processes for food processing and packaging
- Communicate and express ideas through a variety of skills and techniques in food industry
- Evaluate and select materials, techniques and processes to process food and packaging the products as per order.
- Demonstrate the safe and responsible use of tools and materials at workplace
- Ability to work in a commercial or apprenticeship setup

4. JOB OPPORTUNITIES AVAILABLE IMMEDIATELY AND IN THE FUTURE

The Pass outs of this course may find job / employment opportunities in the following areas:

- Work as Technician in Food Processing & Packaging Industry (Level-1II)

5. TRAINEE ENTRY LEVEL:

- Middle or equivalent, with level 2.

6. MINIMUM QUALIFICATION OF TRAINER

- 2-5 years of professional experience in food industry after DAE (Food Technology)/ Bachelor's degree (Food Technology).

7. RECOMMENDED TRAINER: TRAINEE RATIO

- The recommended trainer and trainee ratio is1:25 per class

8. MEDIUM OF INSTRUCTION:

- Urdu, English or Local Language

9. DURATION OF COURSE (TOTAL TIME, THEORY & PRACTICAL)

Module #	Title	Theory (Total Hours)	Practical (Total Hours)	Total Hours	Credit Hours
1	**Apply Work Health and Safety Practices (WHS)**			30	3
2	**Identify and Implement Workplace Policy and Procedures**			20	2
3	**Communicate at Workplace**			30	3
4	**Perform Computer Application Skills**			40	4
5	**Manage Personal Finances**			30	3
6	**Perform Food Processing**	120	480	600	60
7	**Perform Packaging as per Manufacturing Order**	24	96	120	12
8	**Ensure Hazard Analysis Critical Control Points (HACCP) & Food Safety Management Systems**	8	32	40	4
Total Hours					

SUMMARY OF MODULES

The proposed curriculum is composed of 8 modules that will be covered in 1500 hrs. It is proposed that the course may be delivered in 6 months period. The distribution of contact hours (practical & theory) is given below:

- **Theory** (20%) **: Practical** (80%)
- **Theory: hours**
- **Practical: hours**

10. SUMMARY – OVERVIEW OF THE CURRICULUM

Module Title	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 1 **Apply Work Health and Safety Practices (WHS)**	**LU1.**			
Module 2 **Identify and Implement Workplace Policy and Procedures**	**LU1.**			
Module 3 **Communicate at Workplace**	**LU1.**			
Module 4 **Perform Computer Application Skills**	**LU1.**			
Module 5 **Manage Personal Finances**	**LU1.**			
Module 6. **Perform Food Processing**	**LU1.** Prepare food for processing **LU2.** Apply size reduction techniques **LU3.** Apply extraction techniques **LU4.** Apply high temperature techniques **LU5.** Apply low temperature techniques **LU6.** Apply fermentation techniques **LU7.** Apply evaporation techniques **LU8.** Monitor adding of ingredients **LU9.** Push batches to preservation and for packaging process **LU10.** Produce beverages **LU11.** Handle food additives **LU2.** Perform basic calculation	120	480	600

Module 7. **Perform Packaging as per Manufacturing Order**	**LU1.** Receive packaging materials as per manufacturing order (jars, bottles, trays, boxes, tin box etc.) **LU2.** Perform vetting for contamination/sterilization **LU3.** Check packaging materials integrity/quality **LU4.** **LU5.** Verify labeled contents as per manufacturing order **LU6.** Perform over printing **LU7.** Produce samples to try out different materials and designs **LU8.** Ensure packaged products meet set requirements **LU9.** Make tertiary packaging for bulk handling for warehouses storage & shipping/transport **LU10.** Protect finished product from environmental factors	24	96	120
Module 8. **Ensure hazards Analysis Critical Control Points (HACCP) & Food Safety Management System**	**LU1.** Apply HACCP principles in the production **LU2.** Apply food safety management system elements in the production **LU3**. Participate in internal audit procedures	08	32	40

FOOD PROCESSING & PACKAGING TECHNICIAN

Module-6

CBT Curriculum

National Vocational Certificate Level 3

Version 1 - November, 2019

Module.6: 072100985 Perform Food Processing

Objectives: After completing this module, the learner will be able to apply skills and specific knowledge to perform processing functions of food processing by food processing technician in accordance with the industry approved guidelines, procedure as well as the manufacturing order.

Duration:	**Total hours**	**600**	**Practical**	**480**	**Theory**	**120**

Learning Unit	**Learning Outcomes**	**Learning Elements**	**Duration**	**Materials (Tools & Equipment) Required**	**Learning Place**
LU1. Prepare food for processing	**P1.** Perform sorting, grading and peeling methods for fruits and vegetables **P2.** Ensure dressing of Meat, Poultry and Marine food **P3**. Perform shelling of eggs and dry fruits **P4.** Ensure batch loading as per recipe	Define preparatory operations; (washing, sorting, grading, peeling etc.) Describe dressing of meat (removal of skin, removal of viscera and meat cuts etc. Explain the process of shelling of eggs and dry fruits. (candling, washing, breaking, hammering etc.) Describe the process of batch loading (selection, weighing, put values according to recipe in PLC etc.)	10 hours Theory 40 hours Practical Total hours: 50	Rotary washer, color and shape sorter, abrasive peeler, lye peeler, flame peeler, knives, weighing balance, bowls	Class Room and workplace
LU2. Apply size reduction techniques	**P1.** Perform cutting of fruits and vegetables by using different methods **P2.** Perform cutting, mincing, filleting of Meat and Fish	Define size reduction; types of cutting (diced, sliced, cubic etc.); types of cutting equipment's (knives, slicer, etc.) Describe the process of preparing meat and fish for processing. (cutting, mincing, scaling, filleting etc.)	10 hours Theory 40hour Practical Total hours: 50	Knives, slicer, dicer, mincer machine, grinder, milling machine.	Class Room and workplace

	P3. Perform grinding and milling	Describe the process of grinding and milling. (tempering, conditioning, roller mill etc.)			
LU3. Apply extraction techniques	**P1.** Perform extraction techniques in fruits and vegetables **P2.** Perform extraction techniques in Fat and Oil	Define extraction and methods of extraction. (Basket Press, rose head machine etc.) Explain the process of fat and oil extraction	10 hours Theory 40 hours Practical Total hours: 50	Blender, juicer, basket press, food factory, rose head machine, knives	Class Room and workplace
LU4. Apply high temperature techniques	**P1.** Perform pasteurization of different food products **P2.** Perform sterilization of different food products **P3.** Perform (UHT) Ultra High Temperature treatment for liquid foods **P4.** Perform blanching of Fruits and vegetables **P5.** Use dry heat method for different foods	Define pasteurization; methods of pasteurization (HTST, LTLT) Define sterilization. Define the process of UHT. Define blanching; methods of blanching. (Steam blanching, hot water blanching) Describe dry heat methods for baking (Breads, cakes etc.)	10 hours Theory 40 hours Practical Total hours: 50	Pasteurizer, Autoclave, Oven, Steam Blancher	Class Room and workplace
LU5. Apply low temperature techniques	**P1.** Use refrigeration/cold storage methods for different foods **P2.** Use different freezing	Define refrigeration; Explain the process of refrigeration/ cold storage. (Controlled atmosphere storage, conventional storage) Define freezing; methods of	10 hours Theory 40 hours Practical Total	Refrigerator, freezer, immersion freezer, cryogenic freezer, blast freezer	Class Room and workplace

	techniques for foods **P3.** Use different chilling techniques for foods	freezing (conventional, blast freezing, immersion freezing, cryogenic freezing etc.) Define chilling; describe methods of chilling (Air chilling, liquid chilling, ice chilling etc.)	hours: 50		
LU6. Apply fermentation techniques	**P1.** Perform lactic acid fermentation for foods **P2.** Perform Acetic Acid fermentation for foods **P3.** Perform Alcoholic fermentation for foods	Define fermentation; define lactic acid fermentation; explain the Process of lactic acid fermentation (pickle production, yoghurt etc.) Define acetic acid fermentation; explain its process. (vinegar production) Define alcoholic fermentation; explain its process (Bread, alcoholic beverages etc.)	10 hours Theory 40 hours Practical Total hours: 50	Incubator, Fermenter, Air tight vessels, molds, mixer, oven	Class Room and workplace
LU7. Apply evaporation techniques	**P1.** Use different evaporation techniques **P2.** Use spray drying method for liquid foods **P3.** Perform drum drying for	Define evaporation; Explain different techniques of evaporation (climbing film evaporator, falling film evaporator, horizontal evaporator etc.) Define spray drying; explain the process of spray drying. (spray drying of milk, eggs, juices etc.) Define drum drying;	10 hours Theory 40 hours Practical Total hours: 50	climbing film evaporator, falling film evaporator, horizontal evaporator, spray dryer, drum drier, boiler, Steam Generator	Class Room and workplace

	foods	Describe the process of drum drying (tomato slurry drying etc.)			
LU8. Monitor adding of ingredients	**P1.** Check flavor, aroma and appearance of ingredients **P2.** Ensure addition of ingredients as per specification **P3.** Maintain record of ingredients	Define sensory evaluation; methods of sensory evaluation (pair comparison test, rating test, descriptive test etc.) Describe labelling of ingredients; visual inspection Describe record keeping (log books, checklists)	10 hours Theory 40 hours Practical Total hours: 50	Artificial nose, sensory evaluation booths, printer, logbook specimen	Class Room and workplace
LU9. Push batches to preservation and for packaging process	**P1.** Perform incubation/Maturation for different food **P2.** Ensure storage of finished products at low temperature **P3.** Perform Hardening of frozen products	Explain the process of incubation. (fermentation); Explain the process of ageing (cheese) Describe the process of storing at low temperature (chilling, refrigeration, cold storage etc.) Define hardening; explain the process of hardening for frozen foods (ice-cream etc.)	10 hours Theory 40 hours Practical Total hours: 50	Incubator, fermenter, airtight vessels, freezer, refrigerator, blast freezer.	Class Room and workplace
LU10. Produce beverages	**P1.** Prepare carbonated drink as per recipe	Define carbonated beverages; explain the process of carbonated beverages manufacturing. (water treatment, concentrate production, carbonation, filling, capping etc.)	10 hours Theory 40 hours Practical Total hours: 50	Carbonation unit, squeezers, juice extractor, capping machine, Blender, Juicer	Class Room and workplace

	P2. Prepare non-carbonated drink as per recipe	Define non-carbonated beverages; explain the process of non-carbonated beverages manufacturing. (extraction of juices, mixing of ingredients, filling, capping etc.)			
LU11. Handle food additives	**P1.** Use different preservative chemicals for food preservation **P2.** Perform enrichment and fortification **P3.** Use functional additives to improve physical and chemicals properties	Define food additive and preservative; Explain the role of preservatives in food preservation. (nature, type, concentration etc.) Define enrichment and fortification; explain laws regarding enrichment and fortification. (vitamins, minerals) Define functional additives; explain the role of functional additives to improve the characteristics of food. (flavor enhancer, bread improver etc.)	10 hours Theory 40 hours Practical Total hours: 50	Level Transmitters, Agitators, Digital Balance, Volume Measuring Devices	Class Room and workplace
LU12. Perform basic calculation	**P1.** Perform dry and wet calculation for ingredients **P2.** Calculate process losses	Describe the process of weighing wet and dry ingredients. (w/w, w/v) Describe calculation of losses during processing. (drying, spillage, analysis etc.)	10 hours Theory 40 hours Practical Total hours: 50	Weighing balance, measuring spoons, calculator, measuring jugs	Class Room and workplace

FOOD PROCESSING & PACKAGING TECHNICIAN

Module-7

CBT Curriculum

National Vocational Certificate Level 3

Version 1 - November, 2019

Module.7: 072100983 Perform Packaging as per Manufacturing Order

Objective: After completing this module, the learner will be able to apply skills and knowledge to perform packaging of processed products as per industry's approved guidelines and procedures.

Duration:	**Total hours**	**120**	**Practical**	**96**	**Theory**	**24**

Learning Unit	**Learning Outcomes**	**Learning Elements**	**Duration**	**Materials (Tools & Equipment) Required**	**Learning Place**
LU1. Receive packaging materials as per manufacturing order (jars, bottles, trays, boxes, tin box etc)	**P1.** Check and receive printed/ unprinted, leaflets, cups, master cartons, labels as per packing order. **P2.** Maintain the temperature and humidity of workplace as per requirements of specifications of manufactured product **P3.** Check the Batch Number, manufacturing and expiry date against each labeled packing as per manufacturing order **P4.** Ensure all relevant entries manually or electronically as per specifications given in manufacturing order **P5.** Intimate to section in-charge after	Explain types of packaging material. (leaflets, PVC, tin can etc.); Define levels of packaging. (primary, secondary, tertiary) Describe the role of maintenance of temperature and humidity for workplace. (e.g. bread, ice-cream, meat etc.) Explain the procedure for checking information regarding label. (batch number, manufacturing, expiry dates, etc.) Describe the procedure to affirm the entries as per manufacturing order. (ingredients, manufacturing and expiry dates etc.) Describe the importance of	3 hours Theory 11 hours Practical Total hours: 14	Containers, Blister/strip machine, Tertiary packing machine, Printing machines, Metal detectors, Rejecters, Shrink machine, Tape sealers, Lifters for primary packaging material	Class Room and workplace

	completion of task	status log book. (fill status logbook, countersign by section in-charge etc.)			
LU2. Perform vetting for contamination/sterilization	**P1.** Ensure chemicals used for packaging material sterilization are eliminated **P2.** Make sure the drying of packaging material is done according to standard **P3.** Ensure microbial analysis of packaging material before packing	Explain the process of sterilization for packaging material. (air temperature, swab test) Describe the methods of drying for packaging materials. (Hot air drying) Describe the process of microbiological analysis. (TPC, TVC, Swab Test)	3 hours Theory 11 hours Practical Total hours: 14	Incubator, petri dishes, swab sticks, hot air blowers, culture media, colony counter	Class Room and workplace
LU3. Check packaging materials integrity/quality	**P1.** Check Longitudinal Seal (LS) and Transversal Seal (TS) as per standard **P2.** Check thickness and dimensions of packaging material **P3.** Perform leakage test of packaging material **P4.** Perform in process checks to avoid any wastages	Explain the procedure for advanced vision inspection, x-ray test and deformation test etc. Explain the process of grammage test, thickness test and dimension test for packaging material. Describe the process of ink test. (Tetra Pack etc.) Describe steps involved in avoiding wastage. (Design, date print, position of label etc.)	2 hours Theory 10 hours Practical Total hours: 12	X-ray machine, drying oven, pressure test machine	Class Room and workplace
LU4. Verify labeled contents as per manufacturing order	**P1.** Check Batch. No. manufacturing date, expiry and pack size	Describe the verification process for labelling. (batch no., manufacturing date, weight etc.)	2 hours Theory	Weighing balance, sensory evaluation	Class Room and workplace

	P2. Verify printing quality and content as per standard	Describe the procedure to verify the printing quality. (visual inspection)	11 hours Practical Total hours:13	booths, sampling cups	
LU5. Perform over printing	**P1.** Perform cleaning of sensors and printing jets **P2.** Verify alignment of printing on packaging material **P3.** Ensure printing on every packet **P4.** Update batch number according to the manufacturing order **P5.** Check each master carton label before pasting it on each sealed master carton for its product name, Manufacturing date, expiry date, master cartons No., quantity of units & packaging date	Describe process for cleaning of sensors and printing jets. (manual cleaning, use of solvents) Explain alignment of printing. (Visual check position of label and make adjustment) Describe visual inspection of labels randomly. (Randomly inspect the packed product after specified interval) Describe the procedure for updating batch number. Describe the procedure for inspection of master carton for labelling (product name, Manufacturing date, expiry date, master cartons No., quantity of units & packaging date)	2 hours Theory 12 hours Practical Total hours: 14	Solvents, photocell, printer, laser printer, self-inking stamps	Class Room and workplace
LU6. Produce samples to try out different materials and designs	**P1.** Ensure to run the samples as per provided recipe **P2.** Make sure to separate all the batch from running production	Describe the procedure for making sample according to product. (choose of right material, set the proper design, packaging material requirement as per product etc.) Describe the procedure for running newly designed	2 hours Theory 11 hours Practical Total hours: 13	Rigid, semi-rigid, flexible packaging materials, metal containers	Class Room and workplace

	P3. Report to supervisor in case of any deviation regarding new packaging material/recipe	package separately. Describe the importance of reporting any deviation regarding packaging material. (color, shape, Logo, product Change etc.)			
LU7. Ensure packaged products meet set requirements	**P1.** Ensure net content of product as per label **P2.** Ensure packaged product labeling as per regulatory requirements	Explain the procedure of weighing net weight, drained weight and gross weight. Write down regulatory requirements for labelling. (name of product, license number, manufacturing and expiry date etc.)	5 hours Theory 38 hours Practical Total hours: 43	Weighing balance	Class Room and workplace
LU8. Make tertiary packaging for bulk handling for warehouses storage & shipping/transport	**P1.** Perform pelleting of packaged products **P2.** Ensure shrink wrapping of pallets **P3.** Ensure pallet labeling	Define pelleting; Describe the procedure of pelleting. (stacking limit etc.) Define integrity of pellets. Describe importance of pellet labelling. (Proper Storage, FIFO etc.)	5 hours Theory 38 hours Practical Total hours: 43	Stretch/ shrink wrapping machine	Class Room and workplace
LU9. Protect finished product from environmental factors	**P1.** Control temperature and humidity of warehouse. **P2.** Avoid exposure of heat and direct sunlight of finished product	Describe the importance of controlling temperature and humidity during storage. (chemical reactions, shelf life) Explain the effect of heat and sunlight on the finished goods. (browning, discoloration, rancidity etc.)	5 hours Theory 40 hours Practical Total hours: 45	Thermometer, humidity meter	Class Room and workplace

FOOD PROCESSING & PACKAGING TECHNICIAN

Module-8

CBT Curriculum

National Vocational Certificate Level 3

Version 1 - November, 2019

Module.8: 072100984 Ensure hazards Analysis Critical Control Points (HACCP) & Food Safety Management System

Objective: After completing this module, the learner will be able to apply skills and knowledge to control food hazards by applying HACCP, a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement, manufacturing, distribution and consumption of the finished product.

Duration:	**Total hours**	**40**	**Practical**	**32**	**Theory**	**08**

Learning Unit	**Learning Outcomes**	**Learning Elements**	**Duration**	**Materials (Tools & Equipment) Required**	**Learning Place**
LU1. Apply HACCP principles in the production	**P1.** Conduct a hazard analysis to develop a list of hazards which are of such significance and reasonably likely to cause injury or illness (Principle 1) **P2**. Determine critical control points to prevent or eliminate a food safety hazard or reduce it to an acceptable level (CCPs), (Principle 2) **P3.** Establish critical limits as per regulatory standards and industry guidelines, (Principle 3) **P4**. Establish monitoring procedures to produce an accurate record for future use in verification (Principle 4)	Define hazard; Enlist types of hazards; Describe the process to conduct hazard analysis. (previous hazard/ accidental records) Explain the procedure to identify the Critical Control Points in a process line. (heat treatment, cooking etc.) Describe the process to draw Critical Limits. (temperature, time, weight etc.) Define operational pre-requisite program (OPRP); Describe the procedure of monitoring CCP to reduce the occurrence of hazard. (check list, log sheet etc.)	02 hours Theory 16 hours Practical Total hours: 18	Decision Tree, Quality Manual, Charts	Class Room and workplace

	P5. Establish corrective actions to identify health hazards and to establish strategies to prevent, eliminate, or reduce their occurrence (Principle 5) **P6.** Establish verification procedures for identification of the hazards, critical control points, critical limits as per industry guidelines (Principle 6) **P7.** Establish record-keeping and documentation procedures as per industry guidelines/procedure (Principle 7)	Describe procedure to identify problems and to rectify those issues. (Physical, chemical, biological hazards and allergen) Explain the procedure for identification of activities such as auditing of CCP's, record review, instrument calibration as part of verification activities to affirm the removal of hazard. Describe recording information to prove that food was produced safely according to HACCP plan. (Logbooks, checklists, verification procedure etc.)			
LU2. Apply food safety management system elements in the production	**P1.** Ensure Food safety systems based on the HACCP **P2.** Address risks and controls (specific technologies) at various stages of the food supply chain based on food type	Describe the importance of Food Safety Management System in a format that removes the unnecessary technical jargon and instead uses clear, concise language and engaging graphics to help your team understand their role and responsibilities to prepare food safely. Explain the importance of monitoring and their control procedures to produce safe food. (contamination, adulteration, design of equipment etc.)	4 hours Theory 16 hours Practical Total hours: 20	Risk Assessment Tools	Class Room and workplace
LU3. Participate in internal audit	**P1.** Ensure implementation of all relevant SOPs.	Define SOP's; Describe the implementation of SOP's.	2 hours	Checklists, Log Sheets	Class Room

procedures	**P2.** Maintain record of all checklists and logs **P3.** Perform self-assessment and gap closure of all applicable standards	Describe the importance of maintaining record. (checklists, log books) Define risk based internal auditing (RBIA) as a methodology that links internal auditing.	Theory 06 hours Practical Total hours: 08		and workplace

SUPPORTIVE NOTES:

Assessment context, Critical aspects, Assessment conditions

Formative assessment: The specification of the expected performance demonstrated by the trainee at the conclusion of the learning experiences in a particular module or course. It is used to assess the necessary knowledge, skills and attitudes, reflecting the performance standard in the relevant industry or competency standards. Formative assessment may include observation, simulation, questioning, presentation/ demonstration and written assessment at the end of each module. The various methods or techniques used to gather evidence of sufficiency and quality in which to make a sound judgment on the competency of a learner

Summative assessment: Assessors need to plan in advance how they will conduct summative assessments covering all modules. There must be a maximum of 6-8 trainees per assessor and if there are two assessors than 12 students can be assessed within a day and 24 students in 2 days. The entire course can be tested in the summative assessment covering all 16 modules. Direct observation is an important approach in assessing the attitude of the students toward work, observance of safety rules and regulations, and how they interact and relate with other trainees and instructor. Training providers need to decide ways to combine modules into a cohesive two-day final assessment programme for each group of 6-8 trainees. Assessment methods may include observation, simulation, questioning, presentation/ demonstration and written assessment. The various methods or techniques used to gather evidence of sufficiency and quality in which to make a sound judgment on the competency student or learner. Training providers must agree the settings for practical assessments in advance.

LIST OF TOOL AND EQUIPMENT		
SR.NO	**Tools**	**Required items for 24 candidates**
1.	**Food processing system** with retort, pump, boiler, cooker, steamer, dehydrator, concentrator, separator, heat exchanger and all types, mixers, valves all type, actuators, thermocouples, transducers, flow meters, motors (induction & servo), conductivity meters, level switches, sensors type, angle encoders, VFD (variable flow drives), photocells, nozzles, gauges, Solenoid valves and operation, conveyors, weighing scales	1 Unit each
2.	Chiller, compressors, RO (reverse osmoses), Filters.	1 Unit each
3.	Refrigerator, cooling agents,	1 Unit each
4.	Freezer, incubators	1 Unit each
5.	Stoves	6 No.
6.	Jack lift, fork lifter, hand jack's lifter, material moving lifters, hydraulic lifters, palletizers	1 Unit each
7.	Trolley, liquid jacked tanks	1 Unit each
8.	Wheeler	1 No.
9.	Poly/temperature sealer, shrink machines, cylinders	1 Unit each
10.	Cap sealer	1 No.
11.	Pressure canner	1 No.
12.	Pressure cooker	2 No.
13.	Cap seal	1 No.
14.	Oven	1 No.
15.	Steam-jacketed kettle	1 No.
16.	Smoking trays	6 No.
17.	Meat grinder	1 No.
18.	Silent cutter	1 No.

19.	Brix refractometers (0-90^{o} brix)	2 No.
20.	Clinometers	1 No.
21.	Electronic scales (0.1 gm. capacity)	1 No.
22.	Consist meter/viscometer	1 No.
23.	Vacuum pack machine	1 No.
24.	Laboratory scale cabinet drier or forced draft oven	1 No.
25.	Headspace gauge	2 No.
26.	Test equipment – pH meter, centrifuge, moisture meter, color chart/colorimeter, texture meter	2 Unit each
27.	Computer	1 No.
28.	**Firefighting equipment**, fire extinguisher types and uses, fire hydrants, smoke detector, SCABA (Self containing and birthing apparatus), fire Alarms, manual and automatic emergency haters, safety shower, safety harness,	2 unit each
29.	First aid kit	1 No.
30.	**PPE** – apron, face mask, gloves (chemical gloves, surgical, electrical & Steam gloves), gum shoes (rubber shoes) chemical suit, face shelled, safety helmet, air protectives, goggles	24 No.
31.	Computer system	1 No.
	TOOLS/SUPPLIES	
1.	Weighing scales and balances of various capacities and sensitivities	1 No.
2.	Paring knives	6 No.
3.	Peelers	6 No.
4.	Measuring spoons	6 Set
5.	Measuring cups (solid)	6 Set
6.	Measuring cups (liquid)	6 Set
7.	Wrench, screw driver, belts, nuts and bolts, spanners (open, ring combinations) pliers, L kays, star keys, stretched pliers, gas pipe	

8.	Clocks/timer	6 No.
9.	Mixing bowls, stainless steel	6 No.
10.	Hard plastic chopping boards (white, blue, green)	6 unit each
11.	Thermometers of varying temperature range	10 No.
12.	Jar liter	24 No.
13.	Juicer, blender, grinder, chopper, mincer, pulper	2 No.
14.	Wire baskets	3 No.
15.	Casseroles stainless steel	3 No.
16.	Saucepan, stainless steel	6 No.
17.	Spoons, wooden	6 No.
18.	Spoon, basting	6 No.
19.	Paddles, wooden	6 No.
20.	Food tongs	6 No.
21.	Steamer	1 No.
22.	Soaking container	6 No.
23.	Fermented containers	2 No.
24.	Utility trays	6 No.
25.	Colanders, stainless steel	2 No.
PACKAGING MACHINERY		
1.	Automatic can opener	1 No.
2.	Can seam saw	1 No.
3.	Can seam counter sink	1 No.

4.	Can seamer	1 No.
5.	Vacuum can sealer	1 No.
6.	Capping machine	1 No.
7.	Crown corking machine	1 No.
8.	Form fill seal machine (a) 3 side sealing (b) Pillow type	1 No.
9.	Cup filling & sealing machine	1 No.
10.	Horizontal packing machine	1 No.
11.	Twist wrap machine	1 No.
12.	Fold wrap machine	1 No.

Sr. No.	Consumable Items	Quantity for 24 candidates
1	NaoH (PELLETS)	3 Kg
2	HNO_3	3 ltr
3	H_2SO_4	2.5 ltr
4	Ethanol (Absolute)	5 Ltr
5	Phenolphthalein	1 Bottle (100 gm)
6	Burette Set	6 No.
7	Pipette 1ml	10 No.
8	Pipette 5ml	10 No.
9	Pipette 10 ml	10 No.
10	Pipette 10.94 ml	5 No.
11	Auto sucker	10 No.
12	Volumetric flask 100 ml	5 No.
13	Volumetric flask 250 ml	5 No.
14	Volumetric flask 500 ml	5 No.
15	Volumetric flask 1000 ml	5 No.
16	Measuring Cylinder 100 ml	5 No.
17	Measuring Cylinder 500 ml	5 No.
18	Measuring Cylinder 1000 ml	5 No.
19	Reagent Bottles	10 No.
20	Glass Beaker 50 ml	5 No.
21	Glass Beaker 100 ml	5 No.
22	Glass Beaker 250 ml	5 No.
23	Glass Beaker 500 ml	5 No.
24	Pycnometer	5 No.
25	Capillary tube	1 Box
26	Filter paper (90 mm)	2 Box
27	Butyrometer 8 %	5 No.
28	Butyrometer 40 %	5 No.
29	Butyrometer 80 %	5 No.
30	Lactometer	10 No.
31	Rubber stoppers	20 No.
32	China Dish	10 No.
33	Iso amyl alcohol	1 ltr
34	Test tube 20 ml	20 No.
35	Thermometer (0-100 C)	10 No.
36	Plate Count Agar	1 box
37	Violet Red Bile Agar	1 box

38	Potato Dextrose Agar	1 Box
39	Swab Sticks	1 Box
40	S-S Agar	1 Box
41	Inoculating loops	5 No.
42	Spirit lamp	5 No.
43	Hexane	2.5 ltr
44	CMC	1 kg
45	Citric Acid	1 kg
46	Pectin Powder	1 kg
47	Sodium benzoate	100 gm
48	Potassium Metabisulphite	100 gm
49	Sodium Citrate	100 gm
50	Baking Powder	1 kg
51	Yeast (Sachet)	50 No.
52	Baking Soda	1 kg
COLORS		
53	Caramel Liquid	100 ml
54	Apple Green	100 gm
55	Sunset Yellow	100 gm
56	Apple Red	100 gm
57	Cloudifying Agent	250 ml
58	Lime YELLOW	100 gm
FLAVORS		
59	Apple	250 ml
60	Strawberry	250 ml
61	Mango Chaunsa	250 ml
62	Chocolate	250 ml
63	Vanilla	250 ml
64	Orange	250 ml
65	Pineapple	250 ml
SPICES		
66	Salt	1 kg
67	Red Chili (Powder)	1 kg
68	Black pepper (Powder)	500 gm
69	Mix masala	500 gm
70	Chicken Tikka Masala	5 Box
71	Chicken Tandoori Masala	5 Box
72	Chaat Masala	5 Box
73	Chicken Cubes	2 Box

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

National Vocational and Technical Training Commission (NAVTTC)

Plot 38, Kirthar Road, Sector H-9/4, Islamabad, Pakistan
+92 51 9044 322
+92 51 9044 322
info@navttc.org
www.navttc.org